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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

EDITED BY

PROF. G. F. STOUT,

WITH THE CO-OPERATION OF PROFESSOR E. B. TITCHENER, AMERICAN EDITORIAL REPRESENTATIVE, AND OF PROFESSOR WARD, PROFESSOR PRINGLE-PATISON, DAVID MORRISON, M.A., AND OTHER MEMBERS OF AN ADVISORY COMMITTEE.

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MIND

A QUARTERLY REVIEW

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PSYCHOLOGY AND PHILOSOPHY



I.—ANALYSIS OF THINKING. (I.)

BY W. E. JOHNSON.

It is usual to introduce the study of any branch of Philosophy by defining its scope; but the importance attached to demarcating one subject from another has been much exaggerated. On the one hand, it has often involved the false implication that certain fundamental statements that are put forward in one department of knowledge must in some way be modified when transferred to another. This is illustrated by the way in which the standpoints of Science and Philosophy have been broadly contrasted; and, again, in the distinctions drawn within Philosophy between Psychology and Metaphysics, Psychology and Ethics, Psychology and Logic, Logic and Metaphysics, etc. On the other hand, it has frequently led to a shirking of problems on the borderland between two allied studies. In both these connexions, the customary treatment of the relation and distinction between a logical and psychological study of thought must be examined. Taking thought to be a common subject for logical and psychological study, it must be treated in both as involving a mental attitude in which the thinker is in relation to what in the most general sense is called an object. Whereas it is frequently implied, almost without qualification, that Psychology and Logic give entirely distinct treatments of this common topic, the view here put forward is that the preliminary treatment of thinking should be precisely the same, both as regards substance and detail, in each of the two studies. What is common to the two studies

consists in an *analysis* of the process of thinking ; and this analysis has the same value and necessity whether we diverge later along the path of logic or along that of psychology. As regards the divergence, writers are in the main agreed : it is agreed that what distinguishes Logic from Psychology is its consideration of the *validity* of the thinking process, while Psychology treats the thinking process in its *causal* connexions with other aspects of the thinker's experience. While this distinction is universally recognised, the absolute agreement between the two studies where they overlap has been virtually ignored ; and, in consequence, the fundamental analysis of thought is often shirked, both by the logician, who concerns himself with *validity*, and by the psychologist, who concerns himself with *causal connexion*. We must insist upon the necessity of an identical treatment and discussion of the thinking process in the two studies. Thus the relation between Logic and Psychology, so far as thought is concerned, is that they occupy common ground in the preliminary analysis of thought ; and their paths of divergence can only be satisfactorily pursued when there is precise agreement of treatment in this preliminary account.

Before proceeding with this analysis, we may briefly contrast our position with one or two other accounts of the distinction between Logic and Psychology. It is sometimes said that Logic is concerned with thought as a *product*, and Psychology with thought as a *process*. Or again Logic is said to be concerned with the *object* of thought, and Psychology with the *relation* of the thinker to that object. Neither of these distinctions appears to me tenable. Psychology is not solely concerned with process to the exclusion of product ; and, so far as any clear distinction between product and process can be consistently held, neither study can treat the one except in relation to the other. Again, it is a pure myth to suppose that we can treat an *object* of thought apart from its connexion with the thinker ; and it is still more impossible to treat of an act of thinking without reference to the object of thought. We proceed, therefore, to give some preliminary analysis of thinking.

As a basis for further development it is permissible to assume that thinking involves a thinker, an object, and a connexion between them ; and further, that the act of thinking about an object is an *occurrence* in the experience of the thinker. One such occurrence may differ from another in two fundamental respects : first, in regard to the object to which the thought refers, and, secondly, in the way of thinking about that object.

We reserve for the present the difficult problem of what is meant by an object and consequently of what is involved in identity of object, and, assuming such identity, proceed to examine the different respects in which the thinking attitude may vary. In thinking about a table we may be thinking of it as red or thinking of it as square; and this, assuming *identity* in the object of thought, illustrates *difference* in our *characterising* of this object. As our thinking about an object develops, we shall normally introduce a greater and greater number of characterisations, with more and more precise determinations of them. Thus, as our interest or purpose varies, we think at one time of an object as having one quality or relation, and at another as having a quality or relation of a different kind; or again we may be developing our thoughts about an object in a continuous process. The special interest we have at any moment will determine the different characterisations that we predicate of one and the same object; and these different characterisations will constitute our thinking relation at the time to that object.

The above account is fundamentally opposed to that analysis according to which the processes that we have distinguished involve—not differing cognitive relations of the thinker to the same object—but different objects in the same invariable relation of cognition to the thinker. A view which approximates to mine has sometimes been expressed by making an antithesis between the content of thought and the object of reference. This language is legitimate if it is understood that variations of content in thoughts that refer to the same object are to be regarded as variations in the *cognitive relation* to that object. Otherwise the content of thought is exhibited as an object to which is falsely attributed the same kind of particularity as attaches to the object of reference with which it is contrasted: the former being conceived as the mental or inner object in contrast to the latter which is conceived as the real or outer object. This Duplicate Theory of thought, as it may be called, is to be once for all rejected. Its adoption gives rise to the question, what sort of relation does the inner object bear to the outer? The first naïve answer to this old philosophical problem is to the effect that the inner object is a *copy* of the outer. Others have spoken in more or less vague terms of a resemblance, not amounting to exact agreement, and others again of a correspondence which precludes even resemblance but is otherwise undefined; in either case, however, the problem seems to have arisen from a false manner of duplicating the object. There seems to have been a confusion between the

relation of percept to image with the relation of reference to content. The content is supposed to *represent* the object of reference in the same way as the image represents the percept. Now the image may truly be said to represent the percept in the sense that the image is a sort of copy of the percept. In fact there are quite definable aspects in which an image literally agrees with an actual or possible percept. This literal agreement in certain aspects between an image and a possible percept goes along with absolute difference in certain other assignable aspects; and it is a problem for psychology to deal further with the subtle question of the agreement and difference between image and percept in general. This problem does not concern us here. What we have to insist upon is that the relation of content to object of reference is totally different from that of image to percept. For the content is a characterisation of the object of reference, and the image is certainly not a characterisation of the percept. We must here point out the distinction between the words *idea* and *image*, terms which have wrought confusion throughout the history of philosophy, traces of which can be discerned even in Plato. When Hume spoke of ideas as copies of impressions, his doctrine was logically unassailable (however much it might require psychological modification), if by 'idea' is understood 'image'. But, when Locke spoke of the idea of an object, he did not generally mean a copy of the object but a characterising of the object; and in this usage 'idea' may be identified with what has been otherwise termed 'content'. Thus the relation of idea to object, or of content to reference, is not the relation of resemblance which could apply only to terms of the same category, but the relation of characterisation which applies to terms of opposed categories. Locke's philosophy, however, is not free from the charge of duplicating the object, for he speaks of the idea as that with which we are directly cognisant (thus conceiving of it as the inner object), and raises the question whether or not there is a real object answering to the idea. For him the idea is "the object of the understanding when a man thinks". Philosophers like Locke, who use this language, are misled by the form of the word 'idea,' which, though grammatically substantival, has, according to the view which rejects the duplicate theory, a purely relational significance. Thus in the phrase "I have an idea of an object," the words "have an idea of" taken together represent the relation of the thinker to the object; the phrase as a whole means "I am thinking about the object," and the word 'idea' which occurs in place of the relational phrase 'thinking about' indicates

the more or less determinate character which I am assigning to the object in my thought. For a fuller consideration of this question we must turn to another aspect of the thinking process.

There are various ways of defining thought as a special mode of cognition. In the first place thinking is regarded as involving activity, and is thus contrasted with a purely receptive form of cognition to which the term mere awareness may be applied. It is doubtful whether this purely receptive attitude ought to be included under cognition; strictly speaking, mere awareness seems to be a purely momentary phase, inseparable from the impulse to initiate the activity of thought. Now activity is not a momentary phase, but a progressive process; and cognitive activity is a process in which the character of the object given in mere awareness is being progressively determined. In the second place, it is usual to restrict the term thinking to activities belonging to a higher level of intelligence than such processes as sense-perception and imaginative reproduction; but a more comprehensive view would demand that the term should be extended to include these lower cognitive processes on the ground that they involve activity, which is the more important principle of distinction. I shall accordingly use the term thinking in this wider sense to include the activity that is manifested in cognitively determining the character of what is given in sense-impression or sense-imagery, the initial phase of which is known as mere awareness. Thus, of the two principles of distinction so far considered, I propose to reject that which restricts thinking to the higher levels of intelligence, and to retain only the restriction which limits the term to cognitive activity to the exclusion of merely receptive cognition.

In proceeding to a further analysis of thought, we must refer to the phrase 'thinking about' as it occurs in the statement 'I am thinking about a certain object'. Here the object about which I am thinking will be called the object of my attention. Now the process of thinking about an object involves, as we have seen, the cognitive determination of the character of that object; but this process cannot be taken to start from a point at which the cognition of the character is absolutely undetermined; it proceeds rather from a relatively undetermined to a relatively determined cognition of character. We may say that the character under which I cognitively determine the object is a *component* of my thought. In this way we may distinguish, in reference to the same thinking act, between the object of my attention and a component of my thought. Now a component of my thought—which is a

character which I attach to the object of my attention—stands to me in a different relation from this latter. I propose to use the word *apprehension* to denote this relation. Thus, while the object of my attention means the object about which I am thinking, the object of my apprehension will mean the character under which I determine the object of my attention. It must be observed that the act of attention *includes* the act of apprehension, so that the object attended to is a complex which includes the object of apprehension. The two objects (so-called) are not two distinct objects since the one comprehends the other. Thus in "I am [(apprehending) the quality hard as characterising] a certain sensation" the outer bracket represents my relation to 'the sensation,' the inner bracket, my relation to 'hard,' and the mode of bracketing explains why we may speak of 'hard' as an object (*viz.*, of apprehension) and also of 'the sensation' as an object (*viz.*, of attention) and that the act of attention includes the act of apprehension. It is thus permissible to use the word 'object' in two applications in our analysis of thought; in doing so we are not committing the fallacy of the duplicate theory, because we do not interpret the statement "I am thinking about a certain object" as if it meant "I am thinking about the character under which I determine the object about which I am thinking"; for the character is not that about which I am thinking, but a component in my thinking about the object. We have previously maintained that our cognitive relation to any object, say *this sensation*, must be said to vary according as we are thinking about it as characterised by *hard* or as characterised by *cold*. We must now add that our cognitive relation to any quality, say *hard* must be said to vary according as we are apprehending it as characterising *this sensation* or as characterising *that sensation*. The former relation is represented thus: "I am [(apprehending) the quality *hard* as characterising] *this sensation*"; the latter, thus: "I am [(thinking about) *this sensation* as characterised by] the quality *hard*". These formulæ bring out the two *different* kinds of relation in which the thinker may stand to the two *different* kinds of objective element; they may be now restated so as to bring out the correlation of the subjective as such with the objective as such: thus—"I am thinking of (hard as characterising this sensation)"; or "I am thinking of (this sensation as characterised by hard)". What is here enclosed in brackets represents the complete object of my thought, whereas the component (or object of apprehension) and the object of reference, are but incomplete representatives of the object of

thought. Within the object of thought we have distinguished the object of reference, here represented by the phrase 'this sensation,' from the object of apprehension, here exemplified by the character 'hard'.

We have now to consider the nature of our attitude of thought towards an object of reference that is presented prior to any constructive process, and which may be called ultimate. The ultimate object of reference may be said to be *given*; and taking the correlative of giving to be receiving, we may describe our attitude towards the given as receptive. As we have already pointed out, the *purely* receptive attitude is not (properly speaking) cognitive; being a merely momentary phase, upon which the process of cognitive activity may follow. It must be maintained that the relation of receptivity towards any object does not *preclude* simultaneous activity upon that object, nor does it necessarily or invariably *involve* simultaneous activity upon it. In thinking about what is ultimately given—which constitutes the activity of attention—we apprehend some quality as characterising the given; thus, in the most elementary thought process, we are in an attitude of reception towards what is given, and of apprehension towards some quality that may characterise it. We have connected the term *given*, so far, with the notion of the receptive attitude; but the implications of the term may be more positively indicated by reference to the notion of *direct* as contrasted with inferential characterisation. Thus whatever is directly characterised is given; while our characterisation of what is not given is necessarily inferential—as for instance when we characterise another person's experience, or an event in the future or in a remote place. Since we are not always actually characterising what is given, the given must be identified—not with what is being directly characterised—but with what could be characterised without any recourse to inference: the given is thus equivalent to what *can be* directly characterised. Now it will be found that any object that can be said to be given is an occurrence. The assertion, in any particular case, that it is the *given* that is being characterised, would be commonly regarded as indisputable *only* when the occurrence of the act of characterising is contemporaneous with the occurrence characterised. But in my view this limitation is unnecessary, and contemporaneous need not be interpreted with literal and mathematical precision. For, in what is known as primary memory, the thinker must be held to be in the same direct relation to a past occurrence as to a present occurrence; and therefore, in characterising an occurrence

presented in primary memory, he must be said to be characterising the given. Extending the term primary memory, it would seem to be demonstrable—not only that inferential memory *in general* depends upon primary memory—but that any specific inferential memory depends upon a specific primary memory. When we infer that a remembered *s* was *p*, on the ground that any *m* would be *p*, this inference requires the assertion that the remembered *s* was *m*; and this assertion must finally rest upon primary memory. I might have used the term *direct* instead of *primary* memory, but, in introspecting, I cannot distinguish between my direct relation to an approximately immediate, and my relation to a relatively remote, past occurrence.

That the characterised occurrence should be simultaneous with my act of characterising it is obviously not a sufficient criterion for identifying it with the given. On this point two connected questions arise: (1) To what class belongs an occurrence that can be said to be given? (2) In what relation to me must an occurrence stand in order that it may be said to be given to me? My answer to these questions is: that in order that an occurrence may be given, it must be an experience; and in order that it may be given to me, it must be mine. I must explain my use of the term experience. This term is familiarly used as a transitive verb, as in the phrases 'I am experiencing an emotion of anger,' 'I am experiencing a painful sensation,' 'I am experiencing an auditory sensation'. But I hold that this language suggests a false analysis, inasmuch as it makes experiencing into a relation of the experient to the emotion, the pain, or the sensation; whereas, in fact, these expressions merely illustrate what the grammarians call the *cognate accusative*: e.g., "I am experiencing an emotional experience" is analogous to "I dreamed a dream," "He slept the sleep of the righteous". Experience, therefore, is a generic term, of which emotion, sensation, desire, are species; and hence the above phrases are more correctly expressed without introducing the relational use of the term experience, thus: 'A certain experience of mine is an emotion of anger,' 'A certain experience of mine is a painful sensation,' etc. We ought never to speak of an *object* of experience; experiences become objects, *i.e.*, objects of thought, when any thinker—the experient or another—characterises them by such adjectives as painful, loud, hard. Now when the experient characterises his sensation as painful, his attitude towards it would appear to be different from that in which he characterises it as hard. This apparent difference of attitude is accounted for when

we consider that the variable characteristic known as hedonic tone (including pleasantness, unpleasantness, and hedonic neutrality) attaches to all experiences of every kind whatever; and is moreover causally connected according to universally understood laws with such other phases of experience as desire and directed action. In consequence, hedonic tone (etc.) has come to be regarded as a *subjective* mode of characterising experiences, direct knowledge of which is obtained by *introspection*; while other characterisations are regarded as *objective*, and the direct knowledge of these is supposed to be obtained by a method other than introspection. The terminology which distinguishes between subjective and objective *characters* of an experience seems to me to be convenient; but it would be wholly impermissible to divide *experiences* into the two classes—subjective and objective. Assuming that it is universally agreed that at any time there are certain experiences of mine which I can directly characterise, it will be agreed that these experiences are given to me *at that time*. Now what is given to me at any time may be either (1) a present or (2) a past experience. First, as regards any *present* experience: although this can be directly characterised in regard to *some* of its aspects, yet there are other aspects, in regard to which it cannot be directly characterised by the experient. Again, as regards a *past* experience: the experient can directly characterise this only in regard to those aspects under which he had characterised it when it occurred, and which are associated with some apprehended aspect of a present experience. The term 'unconscious' has been used with deplorable vagueness to denote 'what is not cognised'; it has been predicated of an experience, whereas if used at all, it should be predicated of *aspects* or *characters* of an experience; and even then it is essential to note the further distinction between 'not directly-cognised' and 'not directly-cognisable,' terms which it would be preferable to substitute for 'unconscious'. The purpose of this analysis is to point out that in connecting the notion of the given with the notion of direct characterisation, it is necessary to take into account the psychological limitations of the range of possible direct characterisation of even what is given. We must finally point out that what is given is not a bare object, but a union of object and character. The term 'given' is in consequence applied to the character as well as to the object; and in this application—which involves a sort of equivocation—*given* which in its first application was the correlative of directly characterised becomes the correlative of directly apprehended. Now here the notion of

'given' no longer carries with it the implication of mere receptivity, inasmuch as the cognition of character is a distinct psychical act. Yet in contrast with the kind of activity involved in inferential or constructive processes, the activity of direct apprehension (or cognition) of the character of what is given, is adequately described as 'receptivity'.

In adopting the position that experiences alone can be said to be given and directly characterised, I am opposed to those philosophers who maintain that we are in direct cognitive relation with realities other than experiences—whether these are regarded as physical, or of a nature which is neither physical nor psychical. While maintaining, on the one hand, the ontological position that there *are* realities other than experiences—*e.g.*, physical realities and experients—yet I hold, at the same time, the epistemological view that such realities are known only by processes of construction. The special treatment of such categories as cause and substance, which I hold to be involved in the construction of physical realities, etc., cannot be approached until those forms of logical construction which pertain to a *general* analysis of thinking have been considered. For the experient cannot construct such realities without implicitly employing the more general forms of logical construction; and these alone will be treated in this article. To complete the account of the position which I adopt (in agreement with what I believe to be the assumptions of philosophers in general) I must add the two further postulates relating to the given: the ontological postulate, that what is given is *real*; and the epistemological postulate, that what is directly known of the given is *true*.¹

The discussion of logical forms of construction may be begun by assuming that the application of the term proposition is sufficiently well understood, and that I may postpone for the present what I shall have specially to say about its connexion with assertion. We have been considering thought in its aspect of characterising an object; we shall now apply the terms substantive and adjective to that which is characterised and that which characterises, respectively. In borrowing these and other terms from grammar, I apply them in a sense which emphasises the distinction between a word and that which is denoted by a word. Thus I define

¹ *Direct* characterisation of what is given in sense-impression or other modes of experience is often a difficult achievement. When we characterise the visual impression of grass in the dark by the adjective *green*, our judgment is inferential and therefore liable to error; the same holds in characterising our motives and so on.

a substantive-word as that which denotes a substantive; a preposition-word as that which denotes a preposition, etc. Where more than one word is involved, 'phrase' takes the place of 'word': thus a proposition-phrase (otherwise called a sentence) is that which denotes a proposition. It then remains, as belonging to the special province of logic as opposed to grammar, to define the terms substantive, adjective, etc., themselves, as distinct from the words or phrases which denote them; and this logical treatment will lead to certain modifications of grammatical classification. There is some difficulty in defining the terms substantive and adjective, because the freedom of grammatical structure enables us in the first place to express in *substantial* form a term belonging to any other logical category; and consequently, in the second place, to express in *adjectival* form anything that is predicable of such a quasi-substantive. Genuine substantives and genuine adjectives, besides being correlated structurally as characterised and characterising, are to be intrinsically distinguished; whereas quasi-substantives and quasi-adjectives are correlated *merely* structurally.

The proposition will be at once understood to involve the two kinds of component, substantive and adjective—the adjective being essentially an object of apprehension, and the substantive being the object of reference. The simplest proposition which can be expressed in words or symbols will thus assume the form—*s* is *p*, where the symbols *s* and *p* stand illustratively for proper names denoting respectively a substantive and an adjective. Though this is the simplest form of proposition that can be linguistically expressed, we must take note of a more primitive attitude of assertion which precedes the use of proper names; a few examples will illustrate this kind of assertion. Let us suppose that the child hears thunder, and that he can mentally retain similar or different sounds that he has heard before. This presupposes that he has *separated* each auditory experience from other experiences occurring at the same or other times. The act of separation or separative attention is thus the precondition of all further cognitive activity. Separative attention does not imply thinking about one object *as being distinct from another*, but rather thinking about one object without thinking about others. Separative attention to one object, followed by separative attention to another, may next lead to a combined attention to the one and the other, and this will involve an apprehension of the relation of otherness. In primitive acts of thought separative attention to each of a plurality of objects is only possible when the objects are

presented at different times or places.¹ A separative attention to each of several objects and a combinative attention to them as a unity must have occurred before it is possible to apprehend in any determinate way the temporal or spatial modes of connexion amongst them. Hence one direction of cognitive activity is that in which these modes of temporal or spatial connexion are progressively apprehended in an increasingly determinate form. Such *connective* cognition—as we may call it—must be contrasted with *discriminative* cognition, which concerns the *character* of the separated object, in the narrower and more usual sense of the term character. It is sometimes convenient to speak of the characterising process in contrast to the connecting process, although characterisation—in a wider sense—may be said to include both. What is important to emphasise, however, is that before we can, in an act of comparison, identify or discriminate the *character* of one object in relation to the *character* of another, we must have *separated* the one object from the other in a previous act of separative and combinative attention. In briefer language we must have apprehended the relation of otherness between two objects before we can apprehend the relation of identity or of difference *between their characters*. Mr. Bradley has said that we cannot have difference without distinction; here difference means otherness, and distinction means discrimination. I should exactly reverse Mr. Bradley's doctrine, and maintain that we cannot have distinction without difference: or—to put it more precisely and more widely—we cannot have either discrimination or *identification* of character without presupposing the separative act by which otherness of object is apprehended. Separation being thus presupposed, the child may proceed to compare the several sounds to which he has separately attended. If he names the character of one sound as *p*, this will mean that he has identified the *character* of this auditory experience with the *character* of some other auditory experience which he has separated from the former. And again, if he names the character of a third sound by *q*, this will mean that he has discriminated the character of this third auditory experience from that of the first or second. In this way the use of adjective-names is a record of acts of identification and discrimination of *character*. In the same way the use of substantive-names (of the most elementary nature) is a record of acts of separative and combinative attention.

¹ I am assuming, here, that spatial (as well as temporal) relations hold amongst sense-experiences *as such*, apart from reference to physical realities.

That which connective activity cognitively determines is the *existential form* of the object. Thus separating, combining, and connecting are three phases of a progressive cognitive process which may be contrasted with phases of the progressive determination of *character*, in the narrower sense of the term character. When we have to use the term characterisation in the generic sense, we may distinguish its two species by the terms internal characterisation and external characterisation. Now the kind of substantive which can be not only internally characterised, but also characterised as regards its spatio-temporal connexions, will be called an *existent*. So that briefly an existent is a kind of substantive which can be both internally and externally characterised. In fact, a substantive proper—as understood in its ultimately genuine sense—may be identified with an existent. I propose to adopt the word *descriptum* for any term (to whatever logical category it may belong) which is structurally united with an appropriate adjective; the adjective thus united with the descriptum will be termed its *description*; and the union of the adjective with the substantive—i.e., ‘the descriptum as described’—will be termed a ‘*descript*’. An extended application of the notion of a descript will be discussed later. The introduction of the notion of internal contrasted with external characterisation will be serviceable in a later discussion of the burning problem concerning internal and external relations.

Now since an existent extends through a certain portion of Time (and, it may be, through a certain portion of Space), it contains *parts* which themselves extend through Time (and Space), and to each of which separate acts of attention may be directed. Thus a single extended existent is substantively both one and many. Again, taken as substantively one, it may be characterised by a plurality of adjectives; e.g., cold, hard, smooth, which may be said to be *fused*. The apprehension of any one of a number of fused characters will be termed *discernment*:—a notion which must be rigidly distinguished from separation on the one hand and discrimination on the other. We *discriminate* between comparable qualities, such as cold and warm, hard and soft, smooth and rough; but, when we discern the characters cold and hard, we do not discriminate *between* them; neither do we apprehend them as manifested *separately*, but, on the contrary, as characterising the same substantival existent. When separate attention has been directed to different existents—characterised severally (say) by the fused qualities, cold and hard, warm and hard, cold and soft, warm and soft,—acts of

comparison take place by which, while we discriminate and identify the comparable qualities in their several manifestations, we are at the same time discerning each of the non-comparables within its several fusions. To these psychological attitudes logical attitudes correspond. Thus an act of discernment is essential in predicating several different adjectives of the same substantive; while acts of discrimination and identification are essential in predicating the same adjective of several different substantives; and, underlying all, is separative attention to one and to another substantival existent.

To continue our discussion of thought in its general aspect of characterising an object. We have to examine the nature of characterisation, which occurs in every case of joining adjective with substantive; for example 'a cold sensation,' 'a tall man'. In order to understand the verbal juxtaposition of substantive and adjective, we must recognise a latent element of form in this construct, which differentiates it from other constructs,—which also are necessarily expressed by a juxtaposition of words. This element of form constitutes what I shall call the *characterising tie*. The *general* term 'tie' is used to denote what is not a component of a construct, but is involved in understanding the specific form of unity that gives significance to the construct; and the *specific* term 'characterising tie' denotes what is involved in understanding the junction of substantive with adjective. The invariable verbal expression for the characterising tie is the verb 'to be' in one or other of its different modes. To think of 'a tall man' or of 'a cold sensation' is to think of 'a man as being tall,' 'a sensation as being cold'. Here the word 'being' expresses the characterising tie, and the fact that in some cases the word may be omitted is further evidence that the characterising tie is not an additional component in the construct, but a mere formal element. The distinction and connexion between substantive and adjective corresponds to—and in my view *explains*—the distinction and connexion between particular and universal.¹ Ultimately a universal means an adjective that may characterise a particular, and a particular means a substantive that may be characterised by a universal. The terms particular (or substantive) and universal (or adjective) cannot be defined as functioning in isolation, but only as they enter into union with one another through the tie of characterisation. In philosophical discussions which have become historical, as to the nature of the

¹ Here the terms particular and universal are used in the sense current in philosophy, and not in their familiar application in elementary logic, where they stand for subdivisions of the proposition.

particular and the universal, confusion has been prevalent owing to the two applications in which such a term as 'characterise' is used—the one fundamental and the other elliptical. In the phrase "such or such a quality characterises such or such an object," the term 'characterises' is used in its fundamental sense. On the other hand, in the phrase 'the thinker characterises such or such an object,' characterises means "*cognitively determines the character of*," and is thus shown to have been used elliptically. Thus the particular has come to be thought of as an uncharacterised object. But this cannot be taken to mean 'an object without any character'; for every object must have character. The phrase 'an uncharacterised object,' used to denote the particular, must therefore be understood to mean 'An object whose character has not been cognitively determined'. There is of course no ambiguity in the use of the term 'characterise,' since the context prevents confusion; I have freely used the term in both applications, as when I have spoken of a quality *characterising* an object and of an object given *to be characterised*. This last phrase is practically equivalent to the previous description of the particular as what is uncharacterised, and this I can only understand to mean 'not cognitively determined as regards character'; so that I hold that the question as to whether particulars as such exist falls to the ground. I am satisfied with the Aristotelian dictum that the universal exists—not apart from—but *in* the particular, which I interpret to mean that the adjective exists—not apart from—but *as characterising* its substantive; to which I would add that the substantive exists—not apart from—but *as characterised by* its adjective.

So far we have treated the adjective solely in its reference to the substantive which it characterises. We have now to consider a type of adjective whose meaning when analysed exhibits a reference to some substantive other than that which it characterises. Thus we may characterise a certain child by the adjective 'liking a certain book,' or a certain book by the adjective 'pleasing a certain child'. These adjectives, predicated respectively of the child and of the book, are complex; and when we take the substantival reference out of this complex, there remains the term 'liking' or 'pleasing'. These terms do not function as completed adjectives, and will be called relational adjectives. Adjectives of this type may be ranged in a series, according to the number of substantival references involved in their completed form. As examples of the type of adjective which involves *two* substantival references, we may take 'giving *x* to B' and

'lying between X and Z'. 'Supporting P in his accusation of D before J' illustrates the type which involves *three* substantival references. As an example in which an adjective of still greater complexity is predicated, we have:—'G opposes K in his defence of D against the charge of stealing *w* from P before J'. Returning to the simplest form of complexity, we will consider the proposition X likes Y, X is greater than Y. The notion of 'X as liking Y' or of 'X as being greater than Y' is to be distinguished from the notion of 'Y as liking X' or 'Y as being greater than X'. At the same time, the thought of any assigned relation of X to Y involves the thought of a definitely assignable relation of Y to X: for example, the thought of X as liking Y involves the thought of Y as pleasing X; and the thought of X as being greater than Y involves the thought of Y as being less than X. Conversely the thought of "Y as pleasing X" involves the thought of "X as liking Y":—in fact the two are equivalent for thought. Two relational adjectives, such as liking and pleasing, each of which in this way involves the other, are called correlatives. Language in many cases supplies us with names of correlatives, such as greater than, less than. When the relation is grammatically expressed by a transitive verb, the opposition between the *active* and *passive* inflexion is the means which language adopts to express the mutual implication of correlatives; thus pleasing means liked by; liking means pleased by; "X likes Y" means "Y is liked by X," *i.e.*, Y pleases X, *i.e.*, X is pleased by Y. Each of two correlatives is called the converse of the other. Except in the case of the active and passive voice, there is no general rule of language according to which the converse of a given relative can be expressed, and therefore a knowledge of the words in current use is required in order to express a relation in its converse form, as for instance, when we pass from "X is greater than Y" to "Y is less than X". But the object of thought which is verbally expressed in these two different forms is the same, just as we should say that the object of thought expressed by "X is liked by Y" is the same as that expressed by "Y likes X". It must be pointed out that 'liking Y' or 'liking someone,' etc., is a completed adjective; and, in general, out of a relational adjective we may construct a completed adjective by supplementing the substantival reference. And conversely most ordinary adjectives in use can be analysed so as to elicit a relational element as a component. Thus *amiable* contains the relational element 'liked by,' and may be roughly defined 'liked by most people'. Again *substantive* words are con-

structed out of relational adjectives, *e.g.*, shepherd, which means 'a person who takes care of sheep'; but to take the substantives 'shepherd' and 'sheep' as examples of correlatives involves a double error, since the true correlatives involved in the meaning of shepherd are 'taking care of' and 'taken care of,' which are adjectival and not substantival; while the meaning of the word 'sheep' contains no relational element at all.

An ordinary complete adjective will be termed (1) monadic; any incomplete adjective (such as greater than, accusing) will be termed a coupling adjective: a general type, to be subdivided into (2) diadic, (3) triadic, (4) tetradic . . . adjectives. These terms are respectively illustrated by (1) amiable, (2) liking, (3) giving to, (4) accusing of, before, (5) accusing of, on behalf of, before, . . . where the significance of the *prepositions* will be understood by supplementing the substantival references as introduced in our original examples. Now the equivalence of the two propositions '*x* is greater than *y*' and '*y* is less than *x*' will be rendered still more explicit by reformulating them thus:—

x to *y* is-as greater than to less than
or *y* to *x* is-as less than to greater than

Similar formulæ could be applied to triadic and higher orders of adjectives; thus 'X receives *b* from Y' = 'Y gives *b* to X' = . . . will be rendered:—

X : *b* : Y is-as receiving : given by : giving to
or Y : *b* : X is-as giving : given to : receiving from.

Our immediate concern will be with coupling adjectives which are diadic. Given any two substantives—say *x* and *y*—we may construct what will be termed a *substantive-couple*, expressed by the phrase '*x* to *y*'. Similarly, given any two correlative coupling adjectives—say greater than and less than—we construct what will be termed an *adjective-couple*, expressed by the phrase 'greater than to less than'. The significance of a *substantive-couple* is to be explained by defining it as that which may be characterised by an *adjective-couple*; and the significance of an *adjective-couple*, by defining it as that which may characterise a *substantive-couple*. Thus the relation of substantive-couple to adjective-couple is the same as that of an ordinary adjective to an ordinary substantive; and just as the latter are united through the characterising tie, so are the former. Again, just as we say that the *extension* determined by an ordinary adjective is comprised of the substantives of which the adjective may be

truly predicated, so we may say of an adjective-couple that the *extension* which it determines is comprised of the substantive-couples of which the adjective-couple may be truly predicated. A further advantage of formulating the relational proposition in terms of a substantive-couple and an adjective-couple, is that it enables us to explain the process of relational conversion, which may be illustrated as follows :—

- (1) x is greater than y
- ∴ (2) x to y is-as greater than to less than
- ∴ (3) y to x is-as less than to greater than
- ∴ (4) y is less than x .

In passing from (1) to (2) the introduction of the term 'less than' depends merely upon the knowledge of the arbitrary usage of language; but the logical validity of the step rests upon the fundamental principle of thought that every relation has its converse. Each step also requires that the order in which the adjective terms are mentioned is to be understood to correspond to that in which the substantive terms are mentioned. In dealing with triadic and higher types of relation the order in which the terms are mentioned is to be interpreted cyclically, as in the original example of a triadic relation; and by this means a permutation of three or more terms is effected in the same manner as of two.

This account of relational adjectives leads to a consideration of another species of tie which will be termed the *coupling tie*. In the phrase— x to y —and in the phrase—greater than to less than—the word *to* has been chosen to indicate this tie, so that the effect of the coupling tie is to construct a substantive-couple or an adjective-couple. My formulation of the relational proposition, in which the presence of the coupling tie is explicitly indicated, is suggested by the mathematical expression for a ratio; in fact, the arithmetical ratio is a special application of a substantive-couple of which we predicate an adjective-couple. Thus, when we state that this line to that line is as 5 to 3, we are predicating the same adjective-couple of the two substantive-couples—"This line to that line" and "5 to 3". In this case the coupling adjective is "five-thirds of," the converse of which is "three-fifths of". The unitary adjectives of length predicable of the lines themselves as monadic substantives might be, for example, ten inches and six inches respectively. Instead of the preposition *to*, which is perhaps the most common preposition in verbal use to indicate the coupling tie, other prepositions such as *of*, *by*, *for*, *at*, *with*, *in*, and almost any other preposition or prepositional phrase, such as *in reference to*, equally serve to

indicate the nature of the coupling tie. We must not, however, in general say that the preposition denotes a mere tie; for a difference of preposition often means a difference in the relation predicated. For example— x is influenced to move *towards* y —has a different meaning from— x is influenced to move *away from* y . And this difference is more simply shown to involve a difference of relation if we substitute—“attracted to” and “repelled from”. In other words, prepositions in actual verbal use express determinate *modifications* of relation. The essential feature of a tie on the other hand is that it is incapable of modification, and that in consequence it is frequently dispensed with in actual language.

Whenever a tie (whether it be the characterising tie, or the coupling tie or any other) does not appear as an actual word, there are conventions of language which indicate its presence. In languages in which inflexion is largely used, such as Latin and German, there are two main kinds of grammatical rule; namely, the rules of concordance and the rules of governance. We shall find that the rules of concordance correspond to the characterising tie; and those of governance to the coupling tie. The rules of concordance are, briefly, that adjectives and verbs must agree in gender, number, and case, with the substantives that they characterise; so that the characterising tie is not necessarily expressed by use of the word “to be” but merely by inflexion. On the other hand, the rules of governance always determine the *case*, genitive, dative, accusative, or ablative, which is required in using any transitive verb or relational adjective or preposition, coupled with the substantive whose case is to be thus modified. We find, especially in Latin, that considerable changes in the *order* of words (which may vary for purposes of rhetorical significance) are permissible because of the inflexional changes which are understood to indicate (1) how the words are to be attached in thought by the characterising tie as indicated by grammatical *agreement*; and (2) how they are to be attached in thought by the coupling tie, as indicated by grammatical *governance*. Furthermore, where the case-inflexion is used (with or without a preposition) the modification of case signifies not only the coupling tie, but also the special modification of the relation that is to be understood. It follows that, strictly speaking, the coupling tie seldom appears as a word, but is only indicated by a modification of case. Turning from these languages to English, the characteristic of English is that there are no requirements or rules either of concordance or of governance, except in two instances; namely, the first,

second and third persons, singular and plural in many verbs (which illustrate the *characterising* tie) and the accusatives—him, her, them, whom (which illustrate the *coupling* tie). All the other instances of inflexion in English—for example, the possessive pronouns, and the tenses of verbs—are used, not according to any rules of concordance or governance, but to express distinctions of meaning. The difference between the two kinds of inflexion—the one being significant and the other syntactic—is brought out by comparing the English 'her father' or 'his mother,' with the French 'son père' or 'sa mère'. The rule of syntactic concordance, in this case, prevents the distinction between 'his father' and 'her father,' and so on. What in English takes the place of the conventional rules of concordance or governance, is the equally conventional *ordering* of the words. This holds in every instance, with the exception of those few conventional inflexions which have been mentioned above.

The coupling tie,—which might have been called the prepositional tie, in consideration of the grammatical rules of governance, or again the relational tie, in consideration of the philosophical problems that have been raised in regard to the nature of relation—is of fundamental importance in discussing such paradoxes as Mr. Bradley and others have found in the general notion of relation. The paradox is briefly brought out in the following contention: when we think of x as being r to y , we have first to relate x to y by the relation r , and then relate the relation r to x by—say r' —and r to y by—say r'' , another relation. This again will require that x should be related to r' by the further relation r''' , which will lead to an infinite regress on the side of x , and a similar regress on the side of y . This paradoxical contention is met by pointing out that in constructing an object out of the constituents x , r , and y , we do not introduce another constituent by the mere fact of constituting these constituents into a unity. The pretence of paradox is due to the assumption that to the act of relating or constructing there corresponds a special *mode* of relation; so that a tie is confused with a relation. That a tie and a relation are quite distinct is brought out by considering the fact that if, for a given adjective—whether ordinary or relational—we substitute another adjective, we shall have constructed a different unity; but if we drop the so-called *relation* of characterisation with a view to replacing it by another, then no unity can be constructed. Similarly the coupling of terms is not a *mode of relating* them for which another mode of relation could be substituted; for, if they were *uncoupled* no relational unity could be con-

structed. The difference between different kinds of tie, *e.g.*, the coupling and the characterising tie, is logically involved in the difference between the natures of the components tied. Thus the use of an adjective in general involves the characterising tie, by which it is attached to a substantive; and the use of a relational adjective in particular further involves the coupling tie, by which the two substantive terms are attached to one another. In explicitly talking of a tie, I may be misunderstood in appearing to adopt an atomistic view of the elements of thought; but my purpose is, on the contrary, to remove from the theory of relations all taint of atomism; and this is partially effected by denying that the tie is a component or constituent in the construct. The characterising tie resembles a relation in the respect that it can be converted; thus, the tie of adjective to substantive is that of characterising, while the tie of substantive to adjective is that of being characterised by.¹ An infinite regress would arise if we spoke of the adjective as being characterised by the characterising of the substantive; or again, of the substantive as being characterised by being characterised by the adjective. This infinite regress is virtually identical with that put forward by Mr. Bradley. My view would be chargeable with leading to such an infinite regress, if, in introducing the notion of the characterising tie, I had meant to *analyse* the ordinary proposition such as "This is cold," so as to elicit a hidden component expressed by the word "characterise," when I substitute (for the simple form) the expression "This is characterised by (the adjective) cold". The substitution of phrase is not intended for an *analysis* in this sense; since I have maintained that the constituents of this simple proposition are exhaustively expressed by the two words "this" and "cold".

¹ In fact, when we explicitly formulate propositions in terms of characterisation, then *characterising* and *characterised by* have all the formal properties of relations, and might be called *structural* relations.

(To be continued.)

II.—INDIVIDUALITY.

BY CHAS. A. MERCIER.

IN nothing has philosophic investigation a more direct and intimate bearing on practical affairs than in furnishing practical workers with a clear and definite notion of individuality. To define clearly what is meant by an individual is extraordinarily difficult. A definition is very urgently needed in various branches of science, especially in biology; but philosophy is so remote from science and so completely cut off from it that the need is quite unknown to philosophers, and as far as I know no attempt has been made to satisfy it. Individuality is extraordinarily elusive. Usually, when we speak or think of an individual, the mind recurs to an individual human being, and not only takes this individual as a specimen, but also regards it as the type. Very many writers, amongst them many writers on science, who should know better, speak of an individual as synonymous with individual man or woman, and presumably would be surprised to learn that there are other individual things. An individual man or woman is, in the first place, physically separate from other things; and, in the second, is a physically continuous whole, every part of which is in physical continuity with every other part; and since the individual human being is taken as the type of the individual, we are very apt to assume *sub silentio*, and without explicitly admitting the assumption, that these two features are necessary in order to constitute an individual, and are not only necessary, but also are sufficient. A very cursory examination of individuals is enough to show that this assumption is erroneous. Physical separateness or discontinuity from other things is by no means necessary to our concept of an individual. A tree is an individual tree, though it is physically continuous with the ground on which it grows, or if it be said that it is not actually continuous with the ground but only in close contiguity with it, the same can scarcely be said of an individual hair, which is as much an individual thing when it is growing on the head as when it is plucked

out and separated; and the same thing can certainly not be said of an individual country, or peninsula, or bough of a tree, or fiord, or arm of the sea, each of which is an individual thing although it is in physical continuity with other things, from which it is in some cases not definitely demarkated or distinguishable. Nor is physical separateness or discontinuity from other things always sufficient to constitute individuality. The Isle of Wight and the Isle of Thanet are each in a sense physically discontinuous with Hampshire and Kent respectively, yet they are not individual counties, they are parts of counties.

Nor is the physical continuity of its parts either necessary or sufficient to constitute an individual. A box is an individual thing though its lid may lift off. A faggot is an individual faggot, though its component sticks are discontinuous. A bushel of wheat and a pound of flour are individual things though their parts are discontinuous. In these cases the parts, though not continuous, are contiguous. They are in contact with one another; but the parts of an individual thing need not even be contiguous. A swarm of bees is an individual thing as much when the bees are in flight and separated from one another as when they are conglobated into a compact mass. A fleet of ships is an individual thing, although its component parts are widely separated. The Consular Service is an individual thing, although its parts are scattered all over the earth.

It is in biology that the difficulty of defining an individual is greatest, and some of the problems presented by biology are of extreme difficulty. A patch of lichen presents all the appearances of an individual plant. It has a uniform appearance and a definite boundary. It is distinct from its surroundings; its parts appear to be continuous, and are contiguous. More than this, it passes the crucial biological test of reproducing its like. A patch of lichen not only spreads and grows circumferentially into a larger patch, but also reproduces new and similar patches at a distance by dispersing from its surface reproductive elements. Yet the lichen is not one individual plant, but two. It consists of two plants of very different natural orders, a moss and an alga, growing together and intimately commingled. Is it one individual or two?

The flower of a daisy has all the appearance of a single individual. It has definite boundaries; it is made up of differently shaped parts, disposed on a definite plan, of a central disc surrounded by a fringe of rays. Its parts are contiguous, and contribute harmoniously to the same end of

attracting insects. Yet it is not one flower, but very many flowers, each complete with the vital parts of a flower, the pistil and stamens. Is it one individual or many individuals?

In biology, the unit is the gamete, or fertilised egg-cell, and all that grows from a single gamete is a single individual. The ovary is part of the gamete, and the egg-cells are parts of the gamete, as much when they leave the ovary as when they were embedded in it; and they remain parts of the gamete until they are fertilised, when each of them becomes a new biological individual. But it often happens that an egg-cell, without being fertilised, and therefore while still biologically a part of its parent, will grow up into a likeness of that parent, and form an apparently complete plant or animal, separate from the parent, and in structure indistinguishable from the parent. Are they then two individuals, or are they but parts of one individual? They may separate from the parent, or they may not; and if they do not, they may not completely resemble the parent, but may differ both in structure and function, and the parent and its developed offspring may mutually work together and in different ways assist in each other's survival; but should we say assist in each other's survival, or assist in the survival of the whole individual, of which each forms a part?

If a sheep or a rabbit is cut in half, no one would consider each separate half to be an individual sheep or rabbit; and if a rotifer is cut in half, no one would consider each separate half to be an individual rotifer; but suppose the head part of the rotifer grows a tail, and the tail part grows a head, are they now one individual rotifer or two? and if they are two, when did they cease to be parts of one and become two?

All the parts of a tree—root, trunk, branches, twigs, leaves, and flowers—are in physical continuity; and yet each joint or internode between two successive leaves or twigs is not only an individual joint, but is also in a certain sense an individual plant; for it may be cut off the tree and planted in the ground, where it will grow into a second tree. This second tree is an individual tree, but is it an individual plant? It is the product of the same gamete as its parent, and therefore biologically is the same individual. And there is other evidence to support this view. If, as is the case with some plants, the flowers are not fertilisable by the pollen of the same flower or of other flowers growing on the same tree, but require pollen from a different individual tree to fertilise them, then the flowers of the cutting will not fertilise those of the parent tree, nor will the flowers of the parent tree

fertilise those of the cutting. Biologically, therefore, the two trees are still one individual plant. Even if many cuttings are taken and grow into separate trees in many countries, and if cuttings from these again are taken and dispersed over the world, still, as long as the flowers from one specimen will not fertilise the flowers of another, all the trees are biologically a single individual plant.

If this view appears at first to be startling, its strangeness is reduced when we recall other instances, of which there are many, of scattered parts composing but one individual. One has already been given. The Consular Service is an individual thing. That we so regard it is shown by the way we speak of it. We speak of it as *the* Consular Service. We speak of it as *a* good Service or *a* bad Service. We say that *it* ought to be reformed, reconstituted, or left alone. We say that *a* man belongs to *it*. *It* is contemplated as an individual thing, although its part or members are separately dispersed all over the world. In just the same way a plant may be regarded as an individual thing, although its parts or members are separately dispersed all over the world.

We are in the habit of regarding an individual animal as having all its parts continuous, and all enclosed within a continuous skin; and conversely, we regard any collection of animate parts that is continuous and enclosed within the same skin as an individual animal; but there are colonies of actinozoa that are enclosed within a single skin and are physically continuous with one another, and yet are regarded by zoologists not as an individual animal but as a colony consisting of many individual animals. In as far as it is a colony, it is an individual thing; but in as far as it is a colony of animals it is not an individual animal, but many individuals.

It is manifest from these instances that individuality resides, not in things themselves, but in the way we contemplate them. An individual is a contemplate, a mental construct, just as a class is a contemplate and a mental construct. The individual exists in the mind only, just as the class exists in the mind only. What exists in the outer world is not a class of things, but a number of things alike in some respect, and by reason of that likeness the mind is able to gather them up and group them together, not in physical propinquity, but in mental contemplation. The mind contemplates them together, and thus constructs for itself and in itself a class. It is precisely the same, *mutatis mutandis*, with the individual. What exists in the world outside the mind is not an individual, but something that is

contemplated as an individual, some thing or things that the mind contemplates separately from other things and unifies into a single contemplate. It is one, not in physical separateness from other things, or in the physical continuity of its parts, but in contemplation. We may unify the parts by contemplating them together, and then they constitute a single individual, or we may diversify the parts by contemplating them separately, and then they constitute many individuals, either individual parts of one whole, or separate individuals, according as they are contemplated.

Classes are constituted of individuals. Individuals are constituted into classes. Between the individual and the class there is an intermediary stage—the Plural. The plural is always confused with the class and mistaken for the class, by the ordinary man, and still more by the logician, to whom the ordinary man probably owes his blunder. Logicians divide classes into two kinds, the distributive class and the collective class; but it is manifest enough that a class is one individual thing, and one thing can neither be distributed nor collected. What logicians mean when they speak of the distributive class and the collective class is the distributive plural and the collective plural. What is or may be distributed or collected is not the class, but the things in the class; and to confuse the things in the class with the class itself is to confuse the potatoes with the sack. A sack of potatoes is one individual thing, and as one thing may be weighed, carted about, bought, sold, or valued. But the sack cannot be collected, though the potatoes are collected in the sack; and the sack cannot be distributed, though the potatoes may be taken out of the sack and distributed. When we speak of a sack of potatoes being collected, what we mean is that enough potatoes to fill a sack were collected; and what we mean when we say a sack of potatoes was distributed is that enough potatoes to fill a sack were distributed; and it is pretty obvious that the potatoes cannot be distributed until they are taken out of the sack, nor collected unless they are out of the sack. In other words, a distributive class or a collective class is an impossibility. What is meant is a distributive plural or a collective plural.

The concepts of the individual, the plural, and the class grow up together and are necessary to one another. An individual can scarcely be conceived at all, can certainly not be fully and clearly conceived, until it is contemplated as separate from other things; and separateness is a step to plurality, though it may not itself be plurality. Certainly, there can be no plurality without separateness. The plural can scarcely

be conceived at all, can certainly not be fully and clearly conceived, until individuals are seen to be alike. Thus the plural presupposes the individual, as the individual presupposes the plural. The class presupposes both. A class consists of individuals that are alike in some respect. It consists of individuals in the plural; and in my opinion the primary use, value, and purpose of constituting classes is to enable us to speak of things in the plural by a common name, and so to economise time and effort.

Things are to us as we contemplate them. Here is a heap of stones. Contemplate them separately, and each is an individual stone. Contemplate them, not separately, but as separate, and they are plural. Contemplate them as separate but as collected together, and they form a distributive plural, for now each one of them can be taken away and distributed. Each separate stone can be thrown at a separate dog. Contemplate them as not merely collected but combined together, and they form that combined plural which logicians perversely call a collective class. The stones, still retaining their separate individuality, are now in combination enough to fill a cart. Contemplate them still as separate, not separately, but as separate and like one another in respect of being water-worn and rounded, and they are still a plural, but a plural that is capable of entering into the constitution of a class. Contemplate them no longer as separate, but as fused, amalgamated, and unified into a single thing, and they become an individual. This individual, if contemplated solely with reference to its internal composition, as constituted of individual stones that are alike, is an individual whole. Contemplated with respect to its external relations, as distinguished from its surroundings, it is an individual heap. It is a whole heap or a separate heap, or it is a heap of stones, but in either case it is one individual thing. Contemplate the stones as like each other and unlike other stones in respect of being water-worn, and they form, when integrated together with other similar stones, the class of water-worn stones, another individual thing.

Individuality, then, is a mode of contemplating things. An individual is a mental construct or contemplate, as much as a class is. To constitute an individual it is not necessary that it should be physically separate from other things, or even that it should have any physical existence. A custom is an individual thing, an idea is an individual thing; but they have no physical existence. But the individual must be separately contemplable, and separately contemplated. It is not necessary that the parts of an individual should be

physically continuous, or even contiguous, but it is necessary that they should be unified in contemplation. We arrive, therefore, at the following definition :—

An individual is that which is contemplatable, with respect to its external relations as separate from other things, and with respect to its internal composition as unified.

KINDS OF INDIVIDUALS.

As individuals are constituted by the mode of contemplation, so they are classified by the mode of contemplation. We have seen that an individual is constituted by contemplating it in a twofold aspect, that is to say, as to its external relations and as to its internal constitution. The first division that can be made of individuals depends upon which of these modes of contemplation we adopt as primary, and which we relegate to secondary importance.

Contemplated primarily with respect to internal constitution, their external separateness from other things being taken for granted, and for the purpose in hand ignored, individuals may be regarded as consisting of constituent individuals that are discrete and alike. An individual so constituted is a CLASS.

Or it may be contemplated as consisting of parts that may be discrete or continuous, alike or unlike. Such an individual is a WHOLE.

Contemplated primarily with respect to its external relations to other things, its internal composition being for the purpose in hand relegated to a secondary position, an individual may be regarded as like other individuals. In that case, it is one of a plural ; it is capable of entering into the composition of a class ; and as it is inseparably connected with plurality, it may be called a NUMERABLE INDIVIDUAL.

Or, still contemplated primarily with respect to its external relations, the individual may be regarded as unlike anything else. In that case it is no longer susceptible of plurality, or even of singularity. It cannot be spoken of with others as constituting a plural ; it cannot even be spoken of in the singular, nor can it enter into the composition of a class. Such an individual is a UNIQUE INDIVIDUAL.

Unique individuals are of two kinds, according to the mode of measurement of which they are susceptible. Some are measurable by amount, and of them there may be much or little. Such individuals, of which gold, bread, and trade are examples, may be called SUBSTANTIAL INDIVIDUALS, or SUBSTANCES.

Other unique individuals are insusceptible of measurement by amount, and cannot be much or little, but they are measurable by degree, and may be rather or very, slightly or intensely, nearly or completely. Such individuals, of which hard, hardness, full, and fullness are examples, may be termed QUALITATIVE INDIVIDUALS, OR QUALITIES.

Each of these kinds of individual is fruitful on further examination, and for the present purpose we may limit our examination to three aspects:—Experience, Measurement, and Kinds.

Before entering on this examination, it may be well to set forth in a table the results we have already attained.

TABLE I.

An individual is that which is contemplatable separately from other things, and as unified in its composition.

I. Contemplated primarily with respect to internal composition, it may be regarded as composed

A. Of individuals that are discrete and alike.

It is then A Class.

B. Of parts that may be continuous and unlike.

It is then A Whole.

II. Contemplated primarily with respect to its external relations, it may be regarded as

A. Like other things, and is then A Numerable Individual.

B. Unlike other things, and is then A Unique Individual.

1. And measurable by amount

A Substance.

2. And measurable by degree

A Quality.

I. A. THE CLASS.

1. EXPERIENCE.—We have no experience of classes. They are a mode of contemplating things, and have no existence outside the mind. In our commerce with our circumstances we never come across a class. If we want a class we have to make it for ourselves. A class is a fiction. When we meet in experience with things that are alike in any respect, we may collect them together in our minds, contemplate them with respect to their likeness to one another, fuse them together mentally into a single contemplate, and call this contemplate a class; but the things are not collected together anywhere but in our minds, still less are they fused together anywhere but in our minds. A class of men, or of propositions, or of regulations, consists of individual men, or propositions, or regulations, that are not, or need not be, collected together anywhere outside of the mind that classes them,

and cannot outside that mind be fused together. The class is a fiction. It is a convenient mode of contemplating things, but we never come across it in experience. Many other individuals are similarly modes of contemplating things.

2. MEASUREMENT.—Classes are susceptible of measurement in two ways: by size and by comprehensiveness. A class may be large or small, according as it is composed of many individuals or of few; it may be comprehensive or restricted, according as the individuals included in it are diverse or are alike in other respects than the class-quality that enables us to gather them into a plural and fuse them into a class. But, as already explained, a class cannot be numerous or few, though of course classes may be so.

3. KINDS.—A class is an individual thing; and viewed with respect to its internal composition, it may be divided into kinds according to the nature of the individuals of which it is composed, as a class of men, or a class of regulations. These, however, are not, strictly speaking, kinds of classes. The classes are of the same kind, though the individuals that compose the respective classes are of different kinds. In order to divide classes into kinds, we must contemplate them no longer with respect solely to their internal composition, but must regard them in a different aspect, that is to say, with respect to their external relations with things outside themselves. Then classes become susceptible of plurality, they become capable of entering as individuals into the composition of other classes; then, in short, they become numerable individuals. The class that enters as an individual into the composition of another and larger class is called a Species, and the larger class into whose composition it enters is called a Genus. Species and Genera are the only kinds of classes.

I. B. THE WHOLE.

1. EXPERIENCE.—Although the whole is, like the class, a way of contemplating things, yet unlike classes, wholes may be met with in experience. Nevertheless, a whole is experience contemplated in a certain way, and if we choose so to contemplate it, we can construct an imaginary whole out of that which, as met with in experience, is not a whole, or not a complete whole. An apple whose skin is unbroken is a whole apple, and is thus met with in experience; but there are certain sharp-pointed whorled shells that are never met with whole in experience. By the time we have an opportunity of examining the shell, the point is always broken off. A part is always missing. Nevertheless, we can always in

imagination supply the part and contemplate an imaginary whole consisting of the part we do not see added to the part we see; or we may take it as it is, and ignoring the missing part, may contemplate the remainder as a whole, as when we say the whole shell, as we found it, was so long and weighed so much. A whole is, therefore, like a class, a mental construct or contemplate, and may be a fiction; but unlike a class, it need not be altogether fictional. It may be met with in experience; but even if it is, it is not to us a whole unless we so contemplate it. All depends on the mode of contemplation, which in its turn depends on the purpose in view.

2. MEASUREMENT.—Wholes, like classes, are constituted by contemplating primarily their internal composition; and like classes, they are measured by the amount and character of their contents, as large or small, comprehensive or restricted. Unlike a class, a whole is rarely confused with its components. People often speak of a class in the plural, meaning the things in the class; but they never speak of a whole in the plural, meaning the parts.

3. KINDS.—Wholes are of two kinds, complete and incomplete. If all the parts of a whole are present in it, it is a complete whole: if any part is missing, it is an incomplete whole, and is in one sense not a whole; but things are to us as we contemplate them, and we may, if we please, contemplate a number of parts in due relation to one another as a whole, though an incomplete whole, even if some of the parts are missing, and must be supplied by our imagination. For some purposes this mode of contemplation is convenient; for others it is necessary. The mode of contemplation depends on the purpose in view.

II. A. THE NUMERABLE INDIVIDUAL.

1. EXPERIENCE.—The numerable individual may be encountered in the world of experience very much as we contemplate it, that is to say, as isolated, detached, disconnected from other things, or apparently so, as for instance when we see a cloud or a leaf floating in the air; or it may be partially attached to other things, as a tree to the ground, or a house in a row to the houses on either side of it; or it may be wholly embedded in some medium, as a fish in water; or the separation between it and other things may be wholly imaginary, as when in studying hydrostatics we contemplate an imaginary plane of water at a certain depth in a vessel of water; or its whole constitution as an individual may be imaginary, as when we regard a fleet, or a railway, or the

Diplomatic Service as an individual thing. Whether the actual individual we are contemplating is met with in experience or no, some numerable individuals are met with in experience, and these constitute to us *Specimens* of numerable individuals. The experience of specimens enables us to imagine with ease not only other numerable individuals of the same kind, but also other kinds of numerable individuals, specimens of which are not met with in experience.

2. MEASUREMENT.—All numerable individuals are measurable by size, as large or small, and many are measurable in other ways, according to the kind to which they belong and the purpose in view.

3. KINDS.—Numerable individuals are susceptible of division into several very different kinds, according to the disposition and similarity or otherwise of their parts, and according to the principle on which those parts are unified into an individual. The Class and the Whole are constituted by primarily contemplating their internal composition. When we desire to divide them into kinds, we abandon this mode of contemplation, and turn our attention to their external relations. The numerable individual is constituted by primarily contemplating its external relations. When we divide numerable individuals into kinds, we abandon this mode of contemplation, and turn our attention to their internal composition.

Thus, the first division of numerable individuals is into those whose parts follow one another in succession and those whose parts coexist.

The first are Serial individuals, such as a melody, which is a succession of musical notes; a speech, which is a succession of spoken sentences; a journey, which is a succession of changes of place; and so on. Serial individuals may again be divided into the Simple, such as those instanced, in which the succession is single, and the Compound, in which the succession is multiple, such as a shower of rain, a battle, the building of a ship, a disease, and so forth. In these a number of simultaneous successions go to make up a single contemplate, which is then regarded as an individual thing, and signified by the attachment of the indefinite or definite article.

Coexistent individuals may be Simple or Compound, according as their parts are or are not continuous.

A numerable individual whose parts coexist and are continuous is a Simple coexistent individual. Such is a man, a tree, a country, a house, an animal, or a garden.

A numerable individual whose parts coexist but are discon-

tinuous or discrete is a Compound individual, and of Compound individuals there are two kinds.

The first kind of Compound individual consists of parts that are unified into an individual by their likeness to one another. Such are a layer of dust, a ton of coals, a ream of paper, a bushel of wheat, a pair of boots, a covey of partridges, a pride of peacocks, an audience, a crowd, a mob, a congregation. In each case we are contemplating a number of things aggregated together and contemplated as a single thing, as an individual; and in each case the principle that enables us, and in some sort compels us, to unify the several components into a single object of contemplation is their likeness to one another. As these individuals are constituted by the aggregation together of like parts, they may be called Aggregate Individuals.

The second kind of Compound individual is composed of parts that are unlike one another, and the question immediately presents itself: If the parts are unlike one another, how are they to be unified into a single individual? What is the principle of unification? It is simple, and consists in devotion to a common purpose. A railway is contemplated as a single thing, as an individual, and is so spoken of; and a railway consists of many different and diverse parts. It consists of the permanent way, the rolling stock, the stations, the signalling apparatus, the staff of various grades, the Board of Directors, the shareholders, the capital, and so forth, and all these many discontinuous and diverse things are contemplated together and unified by the mind into a single thing—a railway. This is possible because we contemplate all the diverse parts as devoted to the common purpose of transport by rail. Similarly, a venetian blind is a single thing, yet it consists of many discontinuous parts of diverse nature—the slats, the tapes, the cords, the pulleys, and so on. But since all these are devoted to the common purpose of keeping out the sunlight, we are able to contemplate them as a single thing, and to speak of a venetian blind. On the same principle a hive of bees may be contemplated as a single thing, though it consists of bees, and comb, and grubs, and honey, and propolis, and of the cavity or structure that contains them. A fleet is a single thing, though it consists of many discontinuous and diverse things—different kinds of ships, different ranks of men, different calibres of guns; but since all are devoted to the common purpose of fighting at sea, all may be unified in contemplation into a single thing. So it is with an army, a factory, a library, a museum, and a multitude of other individuals. Since individuals of this

kind are unified by the devotion of their parts to a common purpose, they may be called Corporate Individuals.

The kinds of numerable individuals may therefore be tabulated as follows:—

TABLE II.

That which is contemplated primarily in its external relations with other things and is found to be so like other things that it is susceptible of being contemplated together with them in the plural is a Numerable individual.

Contemplated secondarily as consisting of parts, the Numerable individual may consist of parts

A. That follow one another in suc- cession	The Serial Individual.
(a) Singly	The Simple Serial Individual.
(b) in simultaneous succession	The Compound Serial Individual.
B. That coexist, constituting	The Coexistent Individual.
(a) and are continuous	The Simple Individual.
(b) and are discontinuous	The Compound Individual.
(a) and alike	The Aggregate Individual.
(b) and are unlike one an- other	The Corporate Individual.

II. B. THE UNIQUE INDIVIDUAL.

Unique individuals are, as we have seen, of two kinds. The first of these kinds consists of individuals that, though insusceptible of plurality and of degree, are yet susceptible of amount. These I call Substantial Individuals, in harmony with the existing and prevalent practice of calling them, or some of them, substances, a title not given to any individual of another class. Thus gold is called a substance, water is called a substance, bread, meat, lime, granite, wood, and so forth, are called substances. The term is usually limited, it is true, to material substances, and we do not usually call Law, or Commerce, or Diplomacy, or Civilisation a substance; but we have already found, as is found in every science, that the terminology of everyday life needs some modification to adapt it to the necessities of science.

1. EXPERIENCE.—Substantial individuals are met with in experience in samples. We never meet with them as wholes, nor do we ever contemplate them as wholes composed of parts, and as a specimen individual must be a whole, we never encounter them in specimens. We contemplate them as substances encountered in samples. No one has ever seen the whole of gold or of bread, and even to speak of the whole of gold or of bread is manifestly a misnomer. We can indeed

speak of the whole of the gold in the Bank of England, but then we might, if we had opportunity, have actual experience of the whole of this amount of gold, but this is very different from the whole of gold. What we should see, and what we speak of is the whole of an amount, not the whole of a substance. Neither is a substantial individual susceptible of number, or of numerical computation. There are no golds, no breads, no limes, no granites. We may indeed speak of waters, meats, and woods, but when we do so we are using elliptical expressions. We mean kinds of water, kinds of woods, and kinds, or perhaps amounts, of meat. Substances are encountered in samples, and we always assume that every sample is, for the purpose in hand, of the same composition as every other sample. Different kinds of water are, it is true, said to be of different composition, but it is not the water that varies, it is the substances dissolved in the water. Nitrogen was always regarded as a substance, and therefore of uniform composition. As soon as it was found that this is not the case, but that the nitrogen of the air differs from the nitrogen formed in the laboratory, the nitrogen of the air was regarded, not as one substance, but as a mixture of two substances.

2. MEASUREMENT.—Substantial individuals are measured by amount. They are not measured by size, and cannot be large or small. They are not measured by comprehensiveness. They are not measured by number. They are measured by amount. There may be much gold, or water, or bread, or lime, or there may be little; and the amount may be measured by weight or by volume, but then what is weighed or measured is not the substance, but the amount of the substance.

3. KINDS.—It will have been seen by the instances adduced that there are many kinds of substance, or rather, of substantial individuals, and like other things they may be divided in various ways. The only division that is important in the present connexion is into corporeal and incorporeal substances. The difference between them will be readily appreciated from the examples already adduced. Gold, water, bread, and salt are corporeal substantial individuals. Law, commerce, trade, superstition, are incorporeal substantial individuals.

II. B. 2. THE QUALITATIVE INDIVIDUAL.

The name of this kind of individual also is descriptive. A qualitative individual is a thing that when viewed with re-

spect to its external relations is found to be unique, and when examined with respect to its measurability is found to be susceptible of measurement, not by amount, but by degree. Such individuals are commonly called Qualities.

1. EXPERIENCE.—Qualitative individuals are encountered in experience not, like numerical individuals, in specimens; not, like substantial individuals, in samples; but in instances, and always as attributes. Attributes can be mentally abstracted from the substances in which they inhere, but the separation is always an imaginary one. It is never encountered in experience, and does not exist in experience. In experience a quality is always encountered as inhering in some substance as an attribute of that substance.

2. MEASUREMENT, and 3. KINDS.—These must be taken together, for the different kinds of qualities depend on the different modes of measurement of which they are severally susceptible.

In the first place a quality may be contemplated as inherent in a substance, and is then an Attributive quality, and is expressed by an adjective, as white is an attribute of snow and chalk. Or the quality may be contemplated apart from the substances in which it is inherent, and then becomes an Abstract quality, and is expressed in a different manner, by a word of different kind, such as "whiteness," a substantive noun.

All qualities are susceptible of measurement by degree, but the degrees by which different qualities are measured are different, and qualities are divisible into kinds or classes according to the kind of degree that measures them.

First, there are degrees of intensity, applicable only to the first class of qualities, which may on that account be called Intensible qualities. Such are hardness, weight, beauty, goodness, size, and so forth, each of which may exist in any degree of intensity.

Many kinds of qualities are not susceptible of degrees of intensity. There are, for instance, no degrees of completeness, fullness, perfection, straightness, purity, continuity, or circularity. Any of these qualities, if present at all, is present in full, and if it falls short by the shadow of a shade, is in truth absent altogether. These may therefore be called Unintensible qualities, since they are insusceptible of degrees of intensity. But though they are not susceptible of degrees of intensity, they are susceptible of degrees of other kinds, and are divisible into kinds according to the kinds of degree by which they can be measured.

The first kind of unintensive degree is degree of approxima-

tion or departure. A thing cannot be intensely perfect, or very full, or moderately pure, or rather complete, or straight, or circular, or continuous ; but it can be nearly or far from having any of these qualities. A thing must be perfect or imperfect, complete or incomplete, pure or impure, and so on, and there is no middle state or degree between the presence and the absence of the quality, between its full and complete possession and its utter absence ; but there may be any degree of approach to perfection or completeness, or fullness, or purity, and any degree of departure from these qualities. Such qualities may therefore be called Approachable or Departible or Desertible qualities.

Lastly, there is a third class of qualities that do not admit of degrees either of intensity or of approximation. Such qualities as moving, or metallic, or suspended, are, like approachable qualities, either present in full, or absent altogether. There is no middle state, and therefore no degree of intensity. But, unlike approachable qualities, these qualities do not admit of degree even of approach or departure. A thing can no more be nearly moving or far from moving, nearly metallic or far from metallic, than it can be very or rather or intensely moving or metallic. But although they do not admit of degree either of intensity or of departure, they do admit of another kind of degree. They admit of degree of apportionment. Though a thing cannot be either very metallic or suspended, or nearly metallic or suspended, it can be partly or wholly metallic or suspended ; and since they are susceptible of degrees of apportionment, qualities of the third class may be called Apportionable qualities.

Of Intensible qualities there are two very distinct kinds, in one of which the quality begins at a zero point, and from this point extends in gradually increasing intensity without assignable limit. Luminous, for instance, begins at the zero point of dark, noisy at the zero point of silent, dirty at the zero point of clean, flexible at the zero point of rigid ; and from this point they are susceptible of gradually increasing intensity of luminosity, noisiness, dirtiness, and flexibility without assignable limit, there being no point at which we can say that a thing is completely luminous, or noisy, or dirty, or flexible, and the zero point being a sheer barrier, and admitting of no degrees in the minus direction. These we may call Singly Unlimited Intensible qualities.

The second kind of Intensible qualities also has a zero point, but the zero point is not impassable. We can proceed beyond it in a minus direction to an indefinite extent. Goodness, hardness, beauty, ease, cleverness, all begin at a zero

point, and are susceptible of increase of intensity without limit. But the zero point is better called a neutral point, for from this neutral point we can proceed to an indefinite extent backwards, or in a negative direction, in increasing degrees of badness, softness, ugliness, difficulty, and stupidity. These, therefore, may be called Doubly Unlimited Intensible qualities.

Qualities of the Approachable or Departible class again admit of division. For some of them, the degree of departure from the quality is without assignable limit. It can never be said that a thing is completely imperfect, or impure, or crooked. However far we may depart from the quality, a farther departure is conceivable. These, therefore, that are limited in but one direction, may be called Singly Limited Approachable, or rather, Departible qualities.

There are other qualities of the Approachable class from which the departure is not without limit. As we depart from the limit of completeness in one direction, so we approach a limit of negative completeness in the other direction, and when this limit is reached, departure is at an end. We can go no farther. We may depart from perfection to any extent, and our departure is without limit; but as we depart more and more from fullness we approach nearer and nearer to emptiness, and when emptiness is reached our progress is arrested. We can go no farther. We have reached a limit. So, a thing may be quite transparent or nearly or far from transparent; but as we depart from transparency we approach opacity, and when opacity is reached, we can go no farther from transparency. We are brought up with a round turn, and if we move at all, we must retrace our steps. These qualities, therefore, may be called Doubly Limited Departible or Approachable qualities.

Lastly, there is a class of qualities that do not admit of degrees either of intensity or of approximation and departure. Like approachable qualities, such qualities as moving or metallic, or suspended, are either present in full or absent altogether. There is no middle state, and therefore they are insusceptible of degrees of intensity. But unlike approachable qualities, these qualities do not admit of degrees even of approach and departure. A thing can no more be nearly moving or far from moving, nearly metallic or far from metallic, nearly suspended or far from suspended, than it can have these qualities intensely or moderately or slightly. Of such degrees the qualities of the third class are insusceptible: nevertheless they are not wholly insusceptible of degree. They are susceptible of degree of apportionment. Though

a thing cannot be either very metallic or nearly or far from metallic, it can be partly or wholly metallic. Though it cannot be intensely moving or far from moving, it can be moving in part or as a whole. Though it cannot be rather suspended or completely suspended, it may be partly or wholly suspended. Though it can neither be very immersed nor almost immersed, it can be immersed in large part or in small part. Such qualities, since they are susceptible of degrees of apportionment, may be called Apportionable qualities.

We may therefore construct the following table:—

TABLE III.

Qualities are susceptible of degrees, which may be

I. Degrees of intensity measurable from a zero point.	Intensible Qualities.
A. In one direction only.	Singly Unlimited.
B. In both plus and minus directions.	Doubly Unlimited.
II. Degrees of approximation or departure.	Approachable Qualities.
A. The departure may be without limit.	Singly Limited.
B. or to a fixed limit.	Doubly Limited.
III. Degrees of apportionment.	Apportionable Qualities.

III.—VOLITIONAL ATTENTION AND ITS TRAINING.

BY C. W. VALENTINE.

IN recent years educationists have been very much concerned with the doctrine of "formal training". The old view of the faculty psychology—that such a faculty as observation (or memory or judgment, etc.) can receive a *general* training by *any* kind of exercise of that faculty—has fallen into disrepute. Few educational psychologists would maintain, for example, that a boy's practice in the observation of flowers will necessarily improve his observation of Latin endings, or *vice versa*. There is experimental evidence that a training in accuracy in certain kinds of work in arithmetic need not result in any improvement in accuracy in other kinds of arithmetical problems, and that the improvement, by training, of neatness in the written work in one school subject, may have no effect on the written work in other subjects.

Unfortunately, however, there has been a tendency in some quarters to group all the various mental functions together in this respect, and to assume that, because experiments tend to show that the memory in general cannot be improved by a specific training or only to a relatively slight degree, therefore attention and reasoning and all mental functions are in a like case.

It seems to me that more careful psychological analysis of individual capacities and functions is necessary before we can pronounce upon some of these questions or upon the general question of formal training. At the same time it would be well if the question were approached from the other end, and if individual school subjects like Latin or geometry were selected and the mental processes involved in their study analysed, so that we may find what mental functions are likely to be developed by those subjects.

In this paper I have selected volitional attention and the training of attention for special treatment. A full discussion of the question of formal training would require detailed treatment of all the other individual functions, faculties or aspects of mental activity.

The practical importance of such a topic as that of this paper is easily shown. If, for example, there is no general training of attention, then the arguments in favour of the teaching of Classics to the average schoolboy (merely for a few years) are appreciably weakened. The fact that, in proportion to the amount of time occupied by such studies he gets little from the content, is widely admitted. As regards facts and ideas he could certainly get more by devoting the same amount of time to Greek and Roman history and literature in good translations. But it is urged by some that the very difficulty and "dryness" of the study of the languages form a valuable mental training, for it demands mental effort and concentration of attention. The same argument is applied in reference to other subjects, especially mathematics; and in general it was used to defend the teaching of any school subjects by those methods in which the pupil was left to struggle largely unaided with the difficulties of the subject, or at least in which the arrangement of the subject matter was insufficiently accommodated to the various stages of growth of the child mind, and more especially in which little or no attempt was made to appeal to the interests of the child.

Now it would, I think, be generally agreed that the old pedagogy erred in ignoring or minimising the fact that there may be mental activity of an intense degree where interest—immediate interest in the work itself—is at its highest, and indeed that the most valuable and profitable work is done under these circumstances, when mental effort is expended solely in dealing with the inherent difficulties of the subject itself, and not wasted in keeping the mind from wandering to other and more attractive topics. Great constructions of thought, systems of philosophy, scientific discoveries and inventions have come about, not through the painful repetition of volitions to attend to the uninteresting though such may at times have been necessary, but through intense interest in the subject matter dealt with, which made prolonged avoidance of the wandering of attention comparatively easy. "Geniuses," wrote William James,¹ "are commonly believed to excel other men in their power of sustained attention. In most of them it is to be feared that the so-called power is of the passive sort. Their ideas coruscate, every subject branches infinitely before their fertile minds, and so for hours they may be rapt. But it is their genius making them attentive, not their attention making geniuses of them, and

¹ *Principles of Psychology*, vol. i., p. 423.

when we come down to the root of the matter, we see that they differ from ordinary men less in the character of their attention than in the nature of the objects upon which it is successively bestowed."

It seems then that there is much to be said for modern pedagogy in its insistence upon the development of real interests as opposed to the more formal training of the "faculty" of attending in the sense of the capacity to hold our attention to the uninteresting. Few, however, even of these modernists, would dispute that there are times when such efforts of volitional attention are desirable, and that if it is possible to give something by way of a general training of the capacity to control attention, then it is desirable to include opportunities for such training in school work. And the importance of such opportunities would be greater than is at present admitted by those who maintain that, even if volitional attention can be developed by practice, we only increase the power of attention *to the special subjects in which the attention is practised*. Strictly speaking, of course this latter would not necessarily be increasing the power of volitional attention at all. It would rather be developing special interests so that volitional attention becomes unnecessary or less necessary when we are concerned with these particular subjects. The genuine problem of the formal training of attention is this—can we by exercising volitional attention to A increase our capacity of volitional attention to Y and Z, independently of any connexion of interest between Y and A or between Z and A.

The purpose of this paper is to show reasons for believing that this transference of training is *possible*, and how exactly it may take place, but also to show the conditions that appear to be necessary for such a general training—conditions which have been too often ignored.

To answer the question "Is there such a thing as volitional attention" we need first a careful inquiry as to the nature of volitional attention, and I wish to start with Titchener's theory of volitional attention—partly because, if true, it would give *prima facie* little hope of the possibility of general training of attention, and partly because it affords a convenient way of approach to what seems to me a truer account of volitional attention.

I. IS THERE SUCH A THING AS VOLITIONAL ATTENTION?

Titchener's theory is, briefly, that there is no such thing as volitional attention as ordinarily understood. He calls it

"secondary attention" and maintains that it is not really active in the sense which implies spontaneous mental activity. "It is simply the resultant of a conflict of primary attentions. There are rival claimants for the chief place in consciousness, and the standing room is limited. So the attention, as we say, is divided; or perhaps it oscillates between the various impressions presented. Secondary attention is attention under difficulties, attention in face of competitors, attention with distraction. But that is its whole secret; it has no novel feature."¹

I shall try to show, first, that Titchener's theory is inadequate, and later, that the view of attention to which we are led even when following up some of Titchener's own admissions, does not exclude the possibility of a general training of what most psychologists call voluntary attention.

Titchener's theory seems to me inadequate in the following respects:—²

While it is true that in volitional attention there is often a conflict for our attention between two sources of interest, this is not an essential characteristic, and certainly it is not always a prominent element in the situation. Frequently, no doubt, I find it hard to attend to (*a*) because of the attractiveness of (*b*). But on the other hand it often seems that it is hard to attend to (*a*) simply because of its own lack of interest rather than because of the competition of a keener interest. If a student is working at a subject for the sake of an examination, it is often the inherent dullness of his book which causes attention to lapse, a kind of aversion is set up, and *then* some other thing or topic takes its place, sometimes quite a trivial object such as the colour of his blotting-paper, or the idea of making sketches on the margin of his book. Introspectively it seems more accurate to say that these things come to fill a momentary blank in the mind, rather than that they conflict with the book as objects of interest.

No doubt the motive to attend to the text-book may consist of an idea of success in the examination which attracts and holds primary attention; this is the first stage in the process of volitional attention, and thus far Titchener's account is free from objection.

The next stage, however, is not necessarily a conflicting attraction, but rather the thought of the *means* (*a*)—unin-

¹ *Text-book of Psychology*, vol. i., p. 272.

² A full treatment of Titchener's views on attention would require a discussion of his position in reference to conation; but I think that for our present purpose this may be passed over.

teresting perhaps in itself—to attain the end A. Now the means (*a*) gains some interest through its connexion with A; it becomes actually part of the total desired end, because a necessary means to the desired end. Intrinsically the greater interest attaches to A, yet *there is a turning from A to the intrinsically less attractive (a)*, and herein is the very essence of volitional attention. *The mind turns from A because of A and for the sake of attaining A*, and there are cases in which the conflict is rather between (*a*) the means and A the attractive end rather than between (*a*) and some other attractive object (*b*), unconnected with A.

For the purposes of efficient work it is not satisfactory unless the motive or purpose idea A drops into the background, and the inherently uninteresting, or comparatively uninteresting means (*a*) completely fills the field of consciousness. This can only be [in view of the possible competition of more interesting competitors (*b*) and (*c*)] (1) because in some way interest dependent on A attaches to (*a*), —is transferred as it were, and so (*a*) becomes more interesting than A; direct association may explain the fact that (*a*) gains some of A's interest: but we require more here: (*a*) must be felt as, *for the immediate present, more important than A*. Or (2) the transference may take place because the previous volitional state, having A as its object, in some subconscious manner continues to draw the attention to (*a*) in spite of *a*'s lack of interest, and to inhibit the division of attention to the rivals (*b*) and (*c*).

Explanation (1) seems to account for cases in which an altogether exceptional and contingent interest seems to attach to an object, simply because it is serving a special purpose, as for example when we study a usually dull French Grammar and find it interesting because recent conversation with foreigners has revived the desire to master the language. But as far as introspection serves me, the former explanation (1) is not always sufficient. It certainly seems that there are times when the thought of and wish for A is continuing to exercise its influence even when it has disappeared from consciousness and yet without making (*a*) really interesting. Otherwise I cannot explain cases in which I continue to attend to what seems of very little interest, even without (for the time at least) referring back to the reasons for attending to it. Now we may admit to Titchener that there may be at first simply strong *primary* attention to A. But when the attention to (*a*) becomes stronger because of the very strength of A's attraction followed (1) by the realisation that (*a*) is the means to A, that A must be inhibited and (*a*)

attended to; and (2) by the willing to attend to (*a*), surely we have a total situation which is of a special kind among attention processes and justifying a special name; and most certainly we have something other than that mere conflict of two primary attentions which Titchener calls secondary attention, and which is for him the only type of attention other than the simple primary attention.

The point is that here we have a decided case in which, not only is our state of mind determined by the preceding state, but it is determined by a state which includes a resolution to determine its second state.¹

Sometimes the *idea of attending* as such occurs to us and is interesting because it suggests a means of attaining *A* or of asserting ourselves, or "proving our will-power". So we attend to the idea of attending (I purposely follow as closely to Titchener's view as possible). There follows the approval of this idea—as we say, we will attend to (*a*).

What Titchener's view fails to account for is the great influence of this particular process upon subsequent attention. If voluntary attention is merely the result of two conflicting primary attentions, why does this (at least apparent) "will-to-attend" exert such an influence? It is no longer a mere competition of (*a*) and (*b*); for (*a*) has now greatly increased chances. It seems to be backed by a vaster portion of the self than is involved in the mere interest in (*a*) or (*b*) or even in *A*. Further, there is, as has been maintained, the continuation of the influence of the prior state interest in *A* and willing of *A* even when the succeeding state [attention to (*a*)] has taken its place, and this continues at least for a time. And in so far as the attention to (*a*) is dependent on this prior resolution and not merely upon the immediate interest which may develop in (*a*), there is surely something we may legitimately call volitional attention.

That there really is a continuance of influence of the prior state Titchener himself admits, on the following pages of the same volume (pp. 272 and 274), though he speaks of it solely in physiological terms. He supposes the case of a student, when preparing for an examination, disturbed by an alarm of fire in a neighbouring street. "Both ideas, the idea of examination and the idea of fire, are imperative; there is a

¹ This more than satisfies at least Stout's requirements for the admission of the term "mental activity". He says, "I am active so far as a prior state of consciousness determines subsequent, passive so far as change is determined by extra-conscious conditions". (*Analytic Psychology*, vol. i., p. 202.) But in our case there is not only determination by the prior state, there is also the idea of the determination of the succeeding state and the acceptance of that idea.

conflict. The cortex is set in one part for work; and this setting is reinforced by a large number of associated excitations—the nervous processes corresponding to ideas of the examination mark, the consequences of failure, and so on. The cortex is set in another part for going to the fire: and this setting is similarly reinforced by the processes corresponding to a run in the fresh air, an exciting scene, a possible rescue, and so on."

"The side which finally proves to be the stronger, in the struggle of secondary attention, need not necessarily be the stronger. The conflict between working and going to the fire may lead to a victory for work, in spite of the fact that consciousness is more fully occupied by fire-ideas than it is by work-ideas. The nervous system, in virtue of its own bias or leaning, has brought up further reinforcements on the side of work, and these reinforcements have directed or guided consciousness although they themselves are not represented in consciousness. The guiding influence of nervous bias is not a matter of inference, still less a matter of speculation; it can be demonstrated in the physiological laboratory." In reference to a person on whom a psychological experiment in association of ideas is being performed, he says: "A certain tendency impressed upon his nervous system by the experimenter's original explanation, has been effective to direct the course of his ideas long after its conscious correlate has disappeared. And what happens here in the laboratory happens every day of our lives in the wider experience outside the laboratory." Now if such a "nervous bias" can be caused by an experimenter's suggestion, Titchener must surely admit that it may be influenced by a previous strong desire and determination to attend to (a). Some such principle of predetermination seems to be still more clearly implied in his paragraph on "Will," vol. ii, p. 468. "The direction of a present consciousness may be predetermined by a suggestion which was itself represented in consciousness." This confession seems to me to be inconsistent with Titchener's fundamental attitude as regards Volitional Attention. And if he stand by the former we need not quarrel with his physiological theory. For the theory that the cortical processes correlated with the determination to attend to (a) continue to influence or reinforce the continued attention to (a), even when they themselves are no longer accompanied by their characteristic correlated conscious processes, is a physiological theory quite consistent with our view of volitional attention. All we require physiologically is that the cortical processes correlated with the determination to attend to (a)

should be of influence in determining the process correlated with the subsequent attention to (*a*). We maintain that it is of very special influence, but any influence would be adequate to make a distinguishing characteristic of volitional attention.

Considering the mental side too, we could then say that a psychophysical disposition, dependent for its strength first upon the interest of the end *A*, and then upon *A* backed by volition to attend to the means (*a*), continues to determine attention to (*a*).¹

II. THE TRAINING OF VOLITIONAL ATTENTION.

With this preliminary discussion as to the reality and nature of volitional attention, let us turn to the question of the possibility of training volitional attention.

(1) No one, I suppose, would doubt that, if *A* and (*a*) stand for specific processes or ideas, repetition of the process of "reinforcing" or determining (*a*) by *A* will increase the facility of this process of "reinforcement" and tend to fix it as a habit. As Titchener himself says, in reference to the contest between the desire to study for the examination and the desire to go to the fire, "If experiences of the sort are often repeated, so that a habit is set up,—a habit of work or a habit of play,—then the struggle is brief, and secondary attention is quickly replaced by primary".

But the important pedagogical question about which there would not be such agreement is this: does practice in volitional attention, on whatever kind of material it is exercised, result in an improvement of a *general* power of volitional attention to anything and everything. Will the boy who forces his attention to Latin verbs be thereby improving his power of attention to any and every uninteresting thing he may have to deal with in an office?

From Titchener's point of view it may at first appear difficult to see how the "energising of the cortical processes" concerned with the present study, by the processes connected with ideas-of-examination-marks, could strengthen the tendency for the processes determining the idea-of-an employer's-

¹ It may be noticed that I have not referred to sensory adjustment as an aid in attending, although much is made of this by some psychologists. The putting of the sense-organs in favourable positions helps of course in the case of attention to an external object. But this does not carry us far. We may gaze at a book, with our thoughts far away, and when we want to attend to an idea, control of the sense-organs can help almost solely through inhibiting any tendency to attend to external objects.

approval to energise the processes corresponding to attention-to-a-ledger. But even this might be the case if the processes corresponding to a general idea of duty were exercised in the former case (study), and became active again in the latter case, reinforcing the attention-to-ledger process, and thus supporting the idea-of-the-employer's-approval process.

Yet even this would not be a *general* power of volitional attention ; only an increase of that capacity when backed by the idea of duty.¹

Now the possibility of the cultivation of a general power of attention is often assumed by popular writers on Education. The old faculty psychologists also would have approved the idea, while some of the newer educational psychologists would say, " No, interests are specific and so are attention processes ; we may learn by practice to attend to X without this having any improving effect upon our power of attending to Y ". Indeed there is experimental evidence (and that hardly needed) that practice in attention to X may spoil our attention to Y by setting up conflicting interests.

I wish to submit that, while the second mode of development, *i.e.*, that of specific interests and habits of attending is for the average child much the more important in actual learning and training, there is still a certain amount of truth in the doctrine that a general training of attention is possible.

(2) Let us consider the matter, and this time more from a psychological point of view. If capacity for concentrated attention in general is desired, the *will* to attend to what at first sight is uninteresting seems to be one thing at least which we can develop. This can be done if and when a child proves from experience that such volitional attention brings its recompense, either the reward of further interest in the subject, or a reward external to the subject itself. As a result the child will be more willing thenceforth to give heed to the suggestions of a future gain. We may suppose that the idea of the future gain, or that aspect of it which is common to all ideas of future gains, will be strengthened by the stored-up impressions of past gains which have followed the efforts of voluntary attention. In this way that will to determine attention, which is the characteristic of volitional attention, is strengthened as a result of successful experience in the past.

This kind of training of attention has a distinctly moral aspect. For such development as the result of training would be an important element in the development of volitional and

¹ A general idea of expediency might conceivably, together with a general idea of duty, cover all possible cases.

deliberate, as opposed to impulsive action, and also in the pursuance of an ideal under great difficulties. Once mental effort has brought its reward it is undertaken afresh more cheerfully.

“ With aching hands and bleeding feet
We toil and heap, lay stone on stone.
We bear the burden and the heat
Of the long day, and wish 'twere done.
Not till the hours of light return
All we have built do we discern.”

But once we have discerned this, how much more readily do we undertake the next day's labour, if we see that it has been worth while.

Must we then necessarily suppose that volitional attention is a general faculty which on being exercised in any one way is inevitably strengthened for future use; and that it is not a question of the things to which we are attending?

It depends, I think, on the extent to which we generalise on the basis of our particular acts of attention; not necessarily explicitly in words: we may form something like a practical generalisation as we suppose animals do. By “generalise” here I mean realise that mental effort in volitional attention has its reward. In so far as this is realised such generalisation may have its effect on all future occasions when volitional attention is called for. And one at least of its effects may be a lessening of aversion from things *prima facie* uninteresting. They take on, if not a tinge of pleasantness and associated interest, at least a less extreme shade of unpleasantness or boredom. For we realise more vividly now that they are possible means to valuable ends.

Our work may even become self-conscious to a further degree, and we may learn by experience to follow the method of attending to reasons why we should work. But we need not contend that a conscious thought of the success of past efforts is an essential of attention. It would seem possible that the mental activity of turning the attention to an uninteresting thing is, by such *successful* experiences, reinforced, or “stamped in,” in a way analogous to that in which a movement is supposed to be stamped in by the success which follows it, when learning is proceeding by the “method of trial and error”.

In so far as this happens, the act of turning the attention to uninteresting things may become easier on future occasions; it may indeed come to be a species of habit, when the value of some remote interest is realised—a regular kind of

reaction to the general situation "uninteresting-means-to-desirable-end".

It may possibly be suggested that the mere mental act of turning the attention from A (the desired end) to *a* (the means) for the sake of A, may facilitate this process in the future, even if it prove *unsuccessful*. But it seems to me that this is unlikely. In so far as there is an analogy with the more or less subconscious workings of the "method of trial and error," we should expect that only success (and repeated successes) would develop the mental processes concerned. And in so far as fully conscious processes are concerned, it is surely to be expected that repeated *failures* of volitional attention to attain a desired end or to develop an intrinsic interest in the means, would lead to a greater *aversion* from the effort of volitional attention. There would be a lessened inclination to will to attend.

The reply may be made that no *general* weakening of volitional attention need result from such failures—only an increased aversion from these means in particular. But this argument, while a permissible one to the opponents of all general training of attention, would hardly come well from those who support the general training of attention. They can hardly maintain that there is a general, positive, favourable training of attention, but only particular negative results, that is, only particular spoiling of attention for the specific objects concerned in such failures.

(3) Perhaps then we may conclude that the only way in which it seems possible that volitional attention can be cultivated, is through successful acts of volitional attention bringing satisfaction and thus resulting in a general change in the attitude towards things inherently uninteresting but which are seen to be the means to a desirable end.

If this be the only way of developing volitional attention, then the error of the old pedagogy lay in supposing that *all* drudgery gave a mental training and that all acts of attention trained the power of volitional attention. But as we have seen there is no indication that the effort to attend to an uninteresting subject will improve the power of volitional attention except in so far as the efforts lead to success, the attainment of ends really desired, or at least to the development of new interests in the means itself.

If when "the hours of light return" we fail to see anything of value accomplished, there is no encouragement for future efforts. We adults and even some children may be far-sighted, and able to "catch the far-off interest of tears," but we cannot expect that of the average child. The tragedy

of much education is that the children never do see that their drudgery has been worth while. No doubt it often needs time to arouse interest in a given subject, and occasional pressure now may result in interest and spontaneous work later. The mistake, however, of some teachers and of some schemes of education is to be content with "much later" or "never". Further, we do not want to prepare attention to be an abstract power to work *in vacuo*; we want above all, not only that our pupils should be able speedily to find interest in any work which has been done, for the sake of the end in view, but especially that they should have such a rich store of ideas and developed interests that any work is likely to find ready a closely connected interest and so be able to grow an interest for itself. We want this, and not merely the capacity to force attention in general, because the necessity for a constant, deliberate act of volitional attention involves a liability to, and indeed the certainty of, loss of efficiency, and of increase of mental fatigue. The best work is done when attention is equivalent to absorption—when energy is expended in and effort directed to the solution of difficulties in the subject itself and not primarily in the holding of attention to the uninteresting.

(4) Yet these are not the sole aspects of improvement in mental work. With such a general development of attention as we have seen to be possible, all means which are seen to be means to desired ends will tend to become to some extent more interesting; that is, the necessity for volitional attention will become less in general, apart from the development of specific interests.

The relative importance of the two modes of developing attention (*viz.* (i) the development of capacity for volitional attention in general, or (ii) the development of specific interests or habits of attention) is a difficult question. But one or two considerations may be offered on the point.

In the first place, we must surely expect here great individual variations. Let us consider a concrete case. Some youths are studying Latin for the sake of an examinational success, which is important for their future welfare. Latin is, we will suppose, not inherently interesting in itself to youth X. The knowledge of Latin as a whole is dependent, for its interest, largely¹ at least, upon the desirability of suc-

¹ I say "largely" because it is scarcely likely that Latin would be *entirely* without inherent interest, at least after a short time of study. But experienced teachers will agree that it sometimes seems to approximate to this in not a few cases. Of course there are enormous individual variations in the extent to which the mere intellectual activity involved in

cess in the examination, which in its turn we may suppose is interesting simply because of its connexion with success in life. The knowledge of any particular part of Latin is still more remotely connected with success in life. The parts of the verb *fero, tuli, latum* are not even directly connected with success in the examination, though if the student discovered that those forms would be asked for in the examination, how excitingly interesting they would become.

As it is, the series of links is somewhat as follows :—

A	B	C	D
Success in life.	Success in Examination.	Knowledge of Latin as a whole.	<i>Fero, tuli, latum.</i>
Supremely interesting.	Very interesting, because so closely associated with A.	With less firmly attached interest.	Interest still slighter, as this is but a part of C and may prove unessential for B.

Now few would doubt that some youths are better able than others to attach, so to speak, the interest of A to B, and that of B to C. Others realise in a cold intellectual way that C is an essential means for A, and yet remain unable to develop an independent interest in C. No doubt such differences are usually due to the fact that there is little or nothing in the Latin which inherently appeals to the youth, even when he has studied it some time. But if, as we argued above, there is also in fact a possibility of a continuous transference of interest, it seems reasonable to attribute some of the variations among individuals (in respect to the power of volitional attention) to variations of this particular capacity to "transfer" interest. This is the aspect of volitional attention which, in the supposed case above, is probably dependent on a sub-conscious influence of A and B for the attention to C and D. This capacity to find the remote means interesting because of the end, is probably closely correlated with "general intelligence," in which the capacity to hold an idea in the extreme margin of consciousness, and yet in readiness for use, and even to let it influence the ideas at the focus of attention, seems to be often an important element. Thus it may well be that the more intelligent are both originally more capable of this transferring of interest involved in volitional attention, and also (and because

learning Latin proves interesting. These for the sake of the present argument we may ignore.

of that) improve that capacity even relatively more than do the dull. For this capacity when present to a high degree brings its rich reward and thus still further increases its own powers. It is emphatically a case of "To him that hath shall be given"; and further, "from him that hath not shall be taken away even that which he hath," for the pupil originally weak in this capacity to "transfer interest" may actually be made worse by undue strain upon it, leading to failure and disappointment. All this accords well with the testimony of distinguished classical scholars and head masters that the teaching of classics, at least on the old lines, to average or dull boys not only shows little result as regards value in classical scholarship, but may lead to an indifference to, and even to a disgust with, learning in general. Attention has been forced to the inherently uninteresting, and in the case of these pupils no transference of interest has taken place, nor have they the aptitude required for the development of a keen interest in the language themselves.

Thus we have additional reason for testing our pupils well before deciding that they shall go on this or that "side" of the school. A strong case has already been made out by the teachers of foreign languages for the beginning of only one language at a time and the concentration upon it for, say, two years. From our present point of view this would be welcome because we should also thus be able to see whether the boy was likely to take to languages at all (whether he had either a high native linguistic capacity, or a strong capacity to "transfer" interest), before attempting to force one or two other languages upon him.

It is, then, only with the more intelligent pupils that we should expect much in the way of a general improvement of the power of volitional attention as a result of training with a specific subject. This fits in with the fact that it is a characteristic of high intelligence to see relationships (*e.g.*, to realise the unity of means and end) which are not noticed by the less intelligent. I suspect that a similar thing would be found to be true in the case of other mental capacities, namely, that a specific training has a general effect only in the case of the more intelligent persons. It is regrettable that the experimentalists in dealing with the question of formal training have overlooked this important point of individual variation. It may be that when a slight, almost negligible transference of training effect is shown by a large group of persons, analysis would reveal that a few of the most intelligent have shown considerable transference of improvement as a result of the specialised training, but that

the rest of the persons have shown none at all, thus giving a negligible result on the average.

(5) In conclusion, our general argument in favour of there being something in the nature of a general improvement of volitional attention is surely no reason for prescribing, even for the brightest pupils, any subject in school for the sake merely, or even chiefly, of any such training of attention. For whatever subject a boy studies he is sure to meet facts and methods of inherently little interest, which must be attended to for the sake of the whole. An absorbing one-sided interest in a single subject may leave a boy's mind untrained in this respect if he does nothing else. But so long as he pursues a variety of studies, this is not likely to happen; and if he has a great variety of interests, the less important becomes any such general training of volitional attention, for it will *pari passu* be the less frequently needed.

For the dull, and possibly for the average pupil, any attempt to give such a general training of attention through a subject which fails to appeal to the student is probably useless and it may be positively harmful. At the same time such a limited possibility of a general training of volitional attention as has been indicated, would account for the fact that the best boys and students do seem to be able to develop a capacity for concentration of attention on the difficult and uninteresting points in almost any subject, as the result of specialised training in only one or two special selected subjects; but it must be remembered that such specialisation rarely takes place before later boyhood by which time the seeds of "many-sided interests" have probably already been laid.

IV.—THE RELATION BETWEEN ART AND SCIENCE.

BY P. J. HUGHESDON.

THE estrangement of artists and scientists appears to have been a feature of ancient civilisation even before the time of Plato, who by his censure of the poets and by his theory of art (that is the fine arts, in which sense the term "art" will here be used throughout) as consisting in mere imitation "thrice removed from the truth" must have caused fresh bitterness. And in modern times, if there has been less re-creation, yet the opinion is very widely prevalent that art and science are in some sense mutually antagonistic, while among persons who would repudiate such an opinion there seems to be little feeling of any need to establish their essential harmony or even to determine their proper co-ordination. It is of course true that in what, for want of a more satisfactory term, we may call the ideational, as contrasted with the practical sphere, art and science represent alternative and so far mutually exclusive aspects of reality, and habitual occupation with either aspect may impair the mind's capacity for appreciating the other. Yet the aspects with which they are respectively concerned are, the writer would suggest, primarily and normally parallel, or rather correspondent, and complementary. This thesis it is now intended to develop and defend. At a time when education reform on a great scale is being called for and yet is still debated on the basis of the ludicrously inadequate and in part false antithesis of the classics versus science (the latter usually understood in the old and bad but, it would seem, not yet discredited sense in which all knowledge of mind and society is excluded), the present question has considerable immediate importance, since, whatever adaptation to tradition, practical requirement, etc., may be advisable, a satisfactory scheme of education must at least start from a correct view of the relation between the various aspects of truth or spheres of knowledge.

It will be best to deal at the outset with the causes through which the true relations of art and science have to a great

extent been obscured. But first the defectiveness of the correspondence must be admitted. Such defectiveness may be noted in three points, first the large gaps, the frequent failure in the correspondence itself—this is a point which will have to be considered later at some length together with the subsidiary question how far failure is essential, how far a temporary and waning cultural feature ; secondly, the concrete quality of artistic modes of presentment, which excludes anything like a precise delimitation and classification into sociological art, psychological art, etc. ; thirdly, the fact that for most purposes the arts can be distinguished more satisfactorily according to the medium used.

But to these real differences must be added others that are mainly or wholly apparent, that arise from faulty or inadequate conceptions either of art or of science. First, there has been no sufficient recognition in the sphere of art of any distinction answering to the distinction in the sphere of science between relative science and metaphysics. In art of course the dividing line is less clear ; yet unless we are prepared to affirm that art never deals with fundamental truths, that for instance the themes handled in the greater tragedies of Shakespeare are essentially of a lower order than the great problems of speculative thought, or, on the other hand, that art always deals with such truths, a position that would involve quite as great absurdities, we must admit that art too, like science, is concerned with reality on both planes of interpretation.

A second source of error has been the disposition to restrict the name " science " to branches of knowledge founded mainly upon the observation of phenomena (in the strict sense of that term), in respect of which knowledge the parallelism with art is least apparent and, from causes to be noted later, to a great extent breaks down. This defective conception of science has arisen not so much perhaps from the less rapid advance of the sciences of mind as from the grouping of these and especially of psychology with metaphysics and epistemology under the designation " philosophy "—an arrangement, it is true, quite justified as regards certain aspects of knowledge—and the consequent exclusion of such sciences from the scientific series.

Next, a considerable influence must be attributed to the, as it seems to the writer, unfortunate identification of the content of art with the beautiful. It is true that by theoretical writers the word " beautiful " is largely so used as to cover all artistic work, whether beautiful in the ordinary meaning or not, though the unfitness of the word to carry the

meaning thus attached to it has led to the suggestion of various alternatives, the "significant," the "characteristic," etc. Here however we are concerned rather with general than with expert notions, and a usage that in the latter case is merely awkward in the former is the fruit of a palpable error. It might no doubt be contended that the representation in art of much that could not be called beautiful in the ordinary sense does not disprove the view that all art is beautiful, even in that sense; the work of art, so the argument—up to a certain point quite valid—might run, that for instance shows us the ugly as ugly is as really beautiful as the work of science that shows us the erroneous as erroneous is truthful. To make good the conclusion however it would be necessary to prove that in all artistic work there was an implied reference to beauty as the standard, and such a position could not be maintained for a moment in respect of great works of art. The essential excellence of art really consists in the presentation or re-presentation (or merely suggestion), quintessential and appraising and always in some sense concrete, of truth, of the nature of reality. There is certainly in art a further distinguishable element, that namely of formal excellence. Whether formal excellence should be viewed as merely subsidiary to the representative element or whether it has also an independent value as representative or suggestive of formal truth in the concrete is a question which must be considered later; in either case much in art that at first sight appears to be formal may well be subtly and figuratively representative of essential truth.¹ As regards the relation between truth and beauty, to accept without qualification the proposition "Beauty is truth, truth beauty," might be to commit oneself to optimistic monism of an extreme kind; it seems more accurate to say that excellence of whatever sort is in its manifestation always beautiful (even the representation in art of what is far from excellent in itself may be beautiful regarded as a manifestation of the artist's insight into its want of excellence), while conversely beauty is always a property of manifested excellence.

Then again the relation to phenomena both of art and of science has been to a great extent misconceived. In his

¹ This distinction of the formal and the representative elements in art must not be identified with the distinction of style and matter, things that can only be rightly distinguished in much the same way as low and high numbers.

Throughout this discussion the term "expression" is used for the relation of phenomenal medium to content, "representation" for that of art to reality.

most recent work Mr. Balfour speaks of this matter as follows:—

“We have a bad habit of saying that science deals with nothing but phenomena. If by phenomena are meant appearances, it is to aesthetics rather than to science that, on the principle of Solomon’s judgment, phenomena most properly belong. To get away from appearances, to read the physical fact behind its sensuous effect, would be the total and immediate ruin of beauty both in nature and in the arts which draw on nature for their material.”

Apart from the questionable prominence given to the “physical fact,” such a statement, if it does not actually incline towards the opposite onesidedness to that which it controverts, is at least wanting in precision. All the arts and not merely those “which draw on nature for their material” are certainly dependent, though in different ways and degrees, upon phenomenal expressiveness or intelligibility, that is, all make use of media consisting of either perceptive (phenomenal) or imaginatively reminiscent phantasms of sight and hearing and in a less degree of reminiscent phantasms of muscular effort, touch, etc., all such phantasms modelled on natural phenomena either directly and imitatively or indirectly with an elaboration and amplification for the most part neither explicitly realised by the artist nor explicitly interpreted by others. But, this being so, it follows that “to read the physical fact” or rather the element of truth, whether merely physical truth or truth of a higher order, “behind the sensuous effect” but without suppression of that effect, seems to be an accurate description of a very great part of aesthetic interpretation and appreciation. Scientific truths again, or rather such of these as have a direct phenomenal reference, are not really dissociated in thought from phenomena, but are both themselves mentally pictured as phenomenally manifested—even a truth so far beyond the reach of sensible experience as radio-activity makes an appeal to the sensuous imagination—and further are regarded not simply as truths but as explanatory truths, are regarded, that is, in relation to their respective “sensuous effects”. All which would appear to indicate that, apart from constant reference to the phenomenal world, scientific truth would lose not only most of its interest but perhaps something also of its intelligibility. No doubt the connexion of phenomena, actual or reminiscent, with reality is in a sense closer in art because more particularised; in science, on the other hand, it is more generalised and consequently broader. The question will be taken up again later, but one

or two points may be noted here. First, in art phenomena are interpreted, in science they are accounted for (or, to put it at the least, more highly concrete uniformities are resolved into fewer, less highly concrete or ultimately quite abstract uniformities). Next, in the linguistic or "literary" arts, the representation of reality is dependent in a lesser degree upon sensuous expression, whether phenomenal or reminiscent and entirely phantasmic, that is, part of the effect is more clearly in those arts strengthened by, rather than wholly expressed through, the sensuous æsthetic media. Again, in the higher sciences, psychology and sociology, it is not primarily phenomena in the most accurate signification, namely appearances to sense, that are explained, but rather psychical states and dispositions directly and conduct, individual or collective, as motivated by these. In the last place, the relation to phenomena differs not only with the respective arts but also in art and science alike according to the grade of reality under consideration, whether mere being or non-living motion or structure or non-conscious or conscious or self-conscious life.

But perhaps the most confusing factor of all has been the view that art is concerned primarily with feeling, science with thought. Here it must be noted at the outset that "feeling" is a somewhat loose term with varying application. In the present connexion it has at least two distinct, though largely confused meanings, first as equivalent to emotion and secondly as signifying intuition of the vaguer, "instinctive" kind, just as the word "to see" is used for clearer and more certain intuitions.¹ The latter meaning, originating in a psychological analogy—one may further compare the use of the word "sense" in "sense of honour," etc., of words like "touch," "tact," "grasp," or again of the French "entendre"—only requires to be indicated and need not detain us. As regards the connexion with the emotions, neither art nor science seems to the writer to have primarily and directly any such connexion at all. Both are concerned primarily with thought and both secondarily with emotion. The truthful presentment of reality is the essence of both, and if this involves an emotional accompaniment or rather consequence, such an effect, however psychologically necessary,

¹ The two meanings are perhaps confused or combined in the stanza of *In Memoriam* (cxxiv.) :—

A warmth within the breast would melt
The freezing reason's colder part,
And like a man in wrath the heart
Stood up and answer'd 'I have felt'.

is not essential. Thus, to take the case of that art which is most obviously emotional, it seems to the writer that music is the expression not so much of emotional moods as of the attitude of mind behind them. Every emotion or emotional mood of intrinsic æsthetic worth must have a worthy cause in the intelligence, and this, as cause, must be the deeper, the fundamental thing, and therefore the thing that more truly merits and demands expression. The distinction may be made clearer through an illustration. In the case of a voice overheard where the words are either not caught or not understood, the tone may be up to a point quite unmistakably expressive, and we may say, for example, either that it is (emotionally) angry or that it is (intellectually) condemnatory. In such a case, the emotion may of course be primary, as when a bad humour, due perhaps to physiological causes, presupposes to fault-finding; but the reverse is the due order. Secondly, science really agrees with art in having an emotional effect, and differs from it chiefly in the kind of emotion. The emotions to which art appeals—the creator (in science, the discoverer) rather than the recipients of his achievements is here in view—are those that ask to be vented, relieved, that require articulate and objective expression for an urgent but inchoate and formless “inspiration,” the fruit usually of an accumulation of intuitive experience in great part unconsciously registered. The emotions to which science appeals are rather those that ask to be satisfied, appeased, the craving to resolve and to understand. Thus it may be said, if the analogy is not pressed too far, that art emotionally is catabolic, a feature which may also be connected with its more obviously productive or creative character, while science emotionally is anabolic and in its analytical and to a yet greater extent in its deliberate experimental methods more obviously receptive; we may further recall here on the one hand the likening of the art-impulse to the play-impulse and on the other the use of expressions like “thirst” and “hunger for knowledge”. From the distinctions made follows the further difference that artistic creation is generally a more thrilling experience than scientific investigation, but the results of the latter yield a more constantly present satisfaction. Being thus at once less intense and more habitual, the emotional appeal of science has relatively been overlooked. It is not however intended to assert that this appeal is equally powerful in art and in science. The difference is real, not merely apparent, but it is far less than usually supposed; further, it does not consist in any necessarily and invariably closer connexion of

art with æsthetic emotion, but arises chiefly perhaps from the fact that, as will be noted later, art is but poorly fitted for handling the truths investigated by experimental science (and often regarded as the only properly scientific truths); whence art as a whole has been relatively much more concerned than science as a whole with the greater truths, those for instance of human nature, and so at present makes a greater total appeal and probably will always make a greater average appeal to our minds and therefore to our emotions as well. And from the same cause, art much more than science excites emotions that, while natural and human, really are neither artistic nor scientific, though the effect as regards such emotions provides in unæsthetic minds the chief criterion by which artistic worth is judged. We must distinguish too between the emotional accompaniment of artistic or scientific activity and the artistic or scientific treatment of an emotion regarded as a theme or a problem; once more from the same cause such subjects have a relatively greater place in art than in science. Lastly, the fact must not be overlooked that art, owing to its concrete modes of presentation, has a far greater power of awakening emotions (unæsthetic and quasi-æsthetic) through association.

The above argument however perhaps does not adequately meet an objection that has been put to the writer thus: "Though the apprehension of scientific truth normally yields pleasure, you can apprehend it without pleasure and do not consider the absence of pleasure to affect the truth of your thought, while you cannot æsthetically apprehend unless the apprehension is pleasant (or, in case of ugliness, disagreeable), so that the pleasure qualifies the object apprehended, and in a state of emotional apathy one feels it useless to read poetry or look at pictures." To this the writer would be disposed to reply: First, an æsthetically capable mind harassed by emotional apathy can still to some extent distinguish good and bad art, in other words can apprehend æsthetic truth. Secondly, scientific truth apprehended without pleasure is apprehended mainly as dead fact (like purely empirical discovery); so soon as it is brought into organic connexion with one's ideas of reality the apprehension is accompanied with pleasure. At the same time the objection holds good in some measure in respect of scientific truths that are the fruit mainly of observation or experiment, since such truths always have a certain empirical quality.

To the writer then it appears that art and science provide complementary and correspondent conceptions of reality. In both the freely conceiving mind is active; but the *organon*

of art is intuition or imagination (neither word seems quite adequate), through which the *nexus* is divined implicitly in the context of reality and under the aspect of fitness or harmony, that of science is reasoning, through which the *nexus* is recognised explicitly and abstractly, under the aspect of ground or reason. To the likely objection that scientific truth is often divined or at least conjectured intuitively, that in fact the most essential mental process in scientific experiment, namely the framing of hypotheses, is the function of scientific intuition or imagination, it may be answered : First, in the large field common to art and science what under one aspect are scientific truths may under another aspect be perceived or surmised through æsthetic intuition, or again such truths may be perceived or surmised through that practical intuition in which qualities not only of human beings but of objects in any grade of existence are recognised through their phenomenal manifestations ; secondly, genuine intuitions must be distinguished from those apparent intuitions which perhaps are really reasonings of a more or less incipient kind—in the latter case, as the thought develops, its reasoning character becomes manifest.¹ Next, art and science agree in spirit but differ in form ; truth, the nature of reality, prized for its own sake, would seem to be the essential thing in art and science alike ; the essence of art however lies in individualised representation, that of science in generalised explanation ; in the one actuality is re-synthesised (primarily) and intensified through selective redaction of truth ; in the other it is analysed (primarily—such analysis of course involves a secondary stage of synthesis) and clarified (or at least simplified) ; in the one knowledge is subtler and more penetrating, in the other it is better defined and more consciously possessed. Again, while over vast tracts we must depend upon one or other alone, yet the correspondence between their respective spheres is really closer than generally supposed. That this is so can be made sufficiently clear if we very briefly survey the range of art according to the primary classification of the sciences, remembering that for every scientific truth there is also an actual or possible metaphysical interpretation, with general implications and corollaries relating to truths of other orders or reality in other grades.

First then, corresponding in some measure to the scientific conceptions of being as such, the postulates of science, namely

¹ Apparent intuitions of the kind may certainly give rise to mental images ; such images, however, are the mere accompaniments of and aids to thought and have no imaginative quality in the more ordinary meaning of the term.

the uniformity of nature and the persistence of energy, and perhaps in greater measure to the metaphysical conceptions of being (that is, to ontology in the simpler sense excluding the ontological or metaphysical interpretation of the sciences), are certain æsthetic instincts of an indefinite and hardly analysable character; thus matter in great mass affects us mysteriously, inspiring us with an instinctive consciousness or idea—the varying but sometimes considerable subjective contribution in experiences of the kind should be remembered—of what can hardly be called power or life or kinship but seems dimly analogous to all these, and while such influence is largely assignable to qualities of motion, structure, life, consciousness, intelligence, some at least of which are always present, we may perhaps connect with the mere virtue of existence the sense both of latent energy and of fundamental unchangingness, and, behind these again, of qualified “perseity” and of dependence upon a sustaining Power—the actual experience and still more the introspective interpretation of it varies of course considerably according to the person affected. Next, æsthetic insight into the nature of inanimate reality as revealed in physical science is quite limited; thus the representation of a stone suggests little more than the quality of strong, inelastic resistance to pressure, in which at the most only some vague notions as to structure may be contained; at the same time, inanimate nature artistically represented in large masses may be so strongly expressive of material qualities, as weight, rigidity, etc., or of the action, gradual or violent, of natural forces, as even to have scientific, notably geological, interest.¹ Analogous too in character is the impressiveness of structural mass in architectural or engineering erections, especially where these are on a great scale and the material has been handled with skill and insight—in these cases there are of course other expressive qualities, derived from human creative or designing mind. To the metaphysical view of inanimate nature there would seem to be a larger correspondence in art. The character of such intuitions, which are connected chiefly with ideas of strength and persistence, has already been partly noted. It may however be observed here that they have a share in the effectiveness of the primarily formal contrast of inanimate nature, of lofty mountains for instance, with organic and especially with human nature in respect of endurance and transiency, persistence and change, rest and activity. Again, according to Ruskin a very great part of the beauty of nature

¹ But geology of course is not a primary science.

and of artistic representations of nature lies in the typifying of Divine attributes, and, while the notion of type is probably rather over-emphasised by that writer, yet apart from some sense of Divine imaging or workmanship or perhaps of the indwelling and supporting presence of Divinity, the strength of the appeal made to us even by inanimate nature in hill, sea, sky, light, gloom, etc., is not easy to understand. In connexion next with biology and zoology it is obvious that the expression of natural and of animal life has a very great place in art, and the power of art to bring out typical quality and character is here strikingly revealed. Further, the relation of the artistic and scientific aspects of biological and zoological subjects is sometimes close enough to make possible a certain amount of mutual influence. Thus the representation in painting of some natural feature in plant or animal may bring home with new force to the scientist the underlying causal connexion; conversely, the exposition in a scientific work of the precise character of such connexions may help the artist to a more expressive delineation of his subject, though the example must be distinguished from the case of illustrations in a scientific work, which usually stand on the same footing as the accompanying letterpress, draughtsmanship and language alike being used not as æsthetic media but as means of communicating ideas. While in the artistic representation of natural scenery and of animal life contemplated in its natural setting there would thus appear to be many points of contact with "natural science," the interest corresponding to the metaphysical interpretation is perhaps still preponderant, though it must be remembered that this may be in great part a transferred interest, resting on the analogy between aspects of natural and of human life. As regards psychology the compass of art is very wide, but its chief themes have been exceptional (usually heightened and complex) modes of psychical activity or, again, highly individualised personalities in interaction with a highly specialised environment, personal and circumstantial, and this is a field upon which, by reason of perhaps unavoidable preoccupation in the past with the problems of thought and knowledge, to the temporary subordination of other psychical elements, and with the generalities of human nature, psychological science so far has perhaps hardly ventured. When we come to sociology the range of art or at least of artistic achievement shrinks again. The great creations of architecture, it is true, always embody a social note of unison, and every art is able to represent aspects and elements of social truth. Upon the whole, however, there is not outside archi-

ture relatively very much art that could be called sociological in the sense of the social interest being obviously preponderant. In any case, whatever the future range of sociological art, the creation of fictitious cultures and societies with a freedom even distantly approaching that of fictitious personalities in the novel and drama seems impossible. On the other hand, the ease with which social matter of direct value to scientific sociologists lends itself to artistic handling in histories and other descriptive writings seems to indicate that the possible common ground is more extensive here than in the case of psychology.¹ It is however as regards the truths of psychological and sociological metaphysics that art and science seem to draw closest together again, whence, for instance, Dante was able to develop his conception of spiritual reality with constant reference to the speculations of scholastic psychology, human and Divine. Again, the correspondence seems to be clearer throughout in respect of what may perhaps be called art and science in the second degree, that is, artistic or scientific commentary, criticism, interpretation, so that sometimes it may be difficult to say whether such work is rather artistic or scientific in spirit. Yet even here the correspondence is obscured by the fact that while the art of art is known as literary and artistic criticism and interpretation and the science of art as æsthetics, there is no name for and appears to be no explicit recognition of either the science of science or the art of science, such art, that is, as should interpret and set forth in the concrete the true meaning and character of the sciences. The chief work of the science of science, an expression sometimes but in the writer's opinion quite wrongly applied to logic, is the determination of the scope and value and the inter-relations of scientific principles

¹ In strictness sociology should hardly perhaps be reckoned as an independent science since it is not concerned with a distinct grade of reality, the "social consciousness" being either merely a convenient expression for more or less consciously recognised, mutually strengthened, and socially operative likemindedness, or, if meant literally, a figment, "idol". Against this it must be remembered that in passing from psychology to sociology one is conscious of an appreciable change in the way of greater objectivity of view and a larger use of inductive methods.

A brief passing reference may be made here to the controversy whether history is an art or a science or both. A pure art or a pure science it is neither since it deals with fact rather than with artistic or scientific truth. In a looser sense it is both; for it can be handled either on artistic or on scientific lines according as the purpose is to represent or to explain; in the former case it provides material for psychological and sociological art, in the latter case for psychological and sociological science. Of course history has a further and independent interest for its own sake as a record of actuality.

and of the various sciences and branches of sciences, also of relative science and metaphysics. As regards the art of science the writer must own that he scarcely knows where examples may be found. In part this may be due to the limited range of his information ; but in any case the amount of such art cannot be great. Bacon is perhaps the most conspicuous name ; among modern writers Ruskin (in relation chiefly to the social sciences) and Tennyson may perhaps be safely instanced. The attitude of the writers mentioned towards particular speculations is censorious in the main and marred by faulty conceptions ; but all had a real if defective grasp of science.¹

As regards now the art-correlation of the formal sciences—logic and mathematics—it is in the first place obvious that both sciences are concerned with the truths involved in the formal, so far as distinguishable from the essential qualities of reality. Such truths can only be truths of consistency. The writer's limited knowledge is nowhere more limited than in respect of mathematics ; he would surmise however that the ideal (whether fully attainable or not) in the case of pure (or formal) logic and of pure mathematics alike is an entirely generalised and symbolical treatment of reality. The difference between the two sciences seems to the writer to be that the one tends to treat of formal reality as qualitatively or rather as connotatively, the other tends to treat of it as quantitatively or rather as denotatively regarded. The point that these are tendencies should be noticed ; so far as in any particular instance of either science the character attributed to it is only imperfectly realised this must be either because the method proper to the science is incompletely developed or because the problem is not one of purely formal quality. In "mixed" logic and in "mixed" mathematics the test of formal consistency is extended to principles not in

¹ That Bacon wrote science not perhaps, as Harvey said, "like a Lord Chancellor," but largely with the imaginative outlook of an artist, is a suggestion perhaps unlikely to obtain general acceptance. The point cannot be judged apart from a survey of Bacon's works, with which the writer himself has practically no first-hand acquaintance ; but it may be urged here that Bacon does not appear to have had any just appreciation of the scientific work of his age, that his theory of "forms" and his scheme of tabulated records contain no effective contribution to science, that his scientific anticipations may be explained as instances of that "instinctive" and rather cloudy divination of physical or biological truth which occasionally results from great artistic insight—his description of the nature of heat has palpable imaginative quality,—lastly, that his scientific influence has been stimulating rather than directly helpful and is largely attributable to his luminous aphorisms, expressive terminology, and range and splendour of vision.

themselves irresistibly evident through the dilemma that if some assumed principle is not true then formal consistency fails, or else, in proofs where verification is necessary—strictly it is perhaps always necessary for the irresistible proof of essential principles—that the theory of probabilities is not vindicated; since however such absence of vindication is always conceivable even where virtually impossible, proofs of the latter kind always fall short of formal perfection.¹ Between formal science (pure logic and pure mathematics), as thus viewed, and the formal element in art—probably art is never purely formal in quality any more than it is for instance purely psychological or either purely relative or purely absolute—the correspondence must be fairly close. Formal art would also seem to be concerned with relations from which essential interdependence is excluded, with such relations however regarded as relations not of implication but of congruity, both the congruity of similars and also that of dissimilars (in other words effective contrast or antithesis, in which the juxtaposed dissimilars, through mutually bringing out in each other complementary aspects or qualities, combine to present a single integrated whole). It may further be suggested that something in the nature of a mathematical element is most obvious in decorative art and in architecture, perhaps also in music, Leibniz's description of which as an unconscious arithmetic may be recalled, though the reference perhaps was chiefly to the nerve-stimulus, anticipating later discoveries. There is also, it must be observed, in both art and science what may be described as a sub-formal element, related to psychological and physiological laws of attention, effort, etc., and entirely subsidiary in value.

The comparison needs to be completed by a reference to ethics, understood as comprising not merely the ideals of conduct but those also of will and conscience. Reality may be viewed either from the point of view of the actual or from that of the ideal (or right)—what it is desirable should be

¹ A recent definition of mathematics—"The science of the logical deduction of consequences from the general principles of all reasoning"—indicates its close affinity to logic. The view of logic taken above involves the truth of these three propositions: First, purely logical reasoning is essentially hypothetical or rather conjunctive—a typical but quite simple example would be the following—*If A implies B and B excludes C then A excludes C*; secondly, as the example just given shows, such reasoning is not accurately presented in the syllogism with its three terms, always denotative in form and sometimes in meaning, its copula and its categorical conclusion; thirdly, logic is concerned immediately with principles not of thought but of reality, the further matter of the mind's operative recognition and observation of such laws belonging rather to psychology and epistemology.

actualised. The difference certainly is not merely one of aspects, though to make it as far as possible such, that is, to actualise the ideal should be the sovereign aim of human effort and the problem of all practical morals. Further, each of these aspects to a very great extent implies the other—in understanding truly the nature of that which is we also recognise that which should be; hence it is impossible to handle satisfactorily any of the great truths of human nature without close, even if entirely implicit reference to the ideal. When in science the ideal rather than the actual forms the subject of investigation, the problem is ethical. Similarly the themes of art may be primarily ethical; of such art the poetry of Dante is perhaps the best example; in the plays of Shakespeare on the other hand, even where the theme is some example of the conflict of right and wrong, there is an intense and ever-present interest in reality merely as such.¹

Religion finally, though its place has virtually been indicated, should not be passed over without explicit mention. For present purposes religion can only be regarded—however inadequate the conception—as natural theology, which may be described as the artistic or scientific account and interpretation of the pure Ultimate or the unqualified Absolute, in scholastic phrase of that which is both *per se* and *a se*. Such an interpretation is gained most conspicuously along two lines of thought, first the ontological, the consideration of being as such and of its implications, for instance the principle of sufficient reason or the ontological argument, secondly the psychological, as when human qualities are predicated *eminenter* of the Divine Nature; but perhaps every branch of knowledge can here be utilised in some way, directly or indirectly. The relevance of religion to ethics also need not be emphasised.

¹ In some classifications of the sciences ethics figures as the final and crowning science; at other times it is grouped with logic and aesthetics—a somewhat oddly assorted triad—under the category of normative science. In the writer's opinion every branch of knowledge dealing with an aspect of life or existence of whatever grade where there are in any sense actualisable ideals has its quasi-ethical and consequently its normative side, and if this is so, ethics cannot rightly be considered an independent science, but, as concerned primarily and immediately with the personality and with the right disposition even more than with the right ends in conduct, should be treated—whether or not for didactic purposes, at least for those of classification as a branch of psychology. Further, the insertion of sociology between psychology and ethics is surely an indefensible arrangement, since a perfect sociological ethics would involve a real social self-consciousness and will. At the same time in no science do ideals play a greater part than in sociology, and it is obvious that only in close reference to such social ideals can the personal ideals of ethical psychology be worked out in their fullest possible content.

The correspondence is, as already said, obviously defective, and the feature where that defectiveness is most manifest, the comparative incompetence of art over a large area concerned chiefly with relative truth in the lower grades of reality, seems to require a brief consideration. For this it will be best to note first the general relations both of art and of science to phenomena and to the reality behind phenomena. The function of art as regards phenomena is, first, like that of practical intuition but in a rather different spirit (see later), to interpret, to translate these in terms of the corresponding reality; secondly, in the actual creation of works of art to embody such interpretations in imitative or analogous phenomena or through direct, non-phenomenal appeal to the sensuous memory. The reality however that phenomena express is almost entirely the higher-grade but remoter reality; in the human face or voice for instance what phenomena express primarily and mainly is the remotest, the psychical reality, that is, states and dispositions of soul, then the biological or physically vital, while concerning the merely physical reality investigated in chemistry and physics they are perhaps totally unsuggestive. The function of art as regards reality is to set forth recognisable truth, truth to some extent self-evident when once set forth and not urgently calling for verification—indeed, strictly understood, verification is impossible in art—and this function it fulfils with the aid but not entirely through the instrumentality of phenomena and phenomenally derived phantasms.¹ The function of science as regards phenomena is in the physical sciences (physics and chemistry) to explain them by, in a sense to resolve them into non-phenomenal factors and processes (in physics one might say to some extent into sub-material activities), in the biological sciences to explain them by factors and processes that are partly phenomenal or phenomenalisable (as the biological unit, the cell, with the help of the microscope) and partly non-phenomenal (metabolism for instance as regards its chemical character), while the connexion throughout between phenomenal appearances and the non-phenomenal factors and activities corresponding thereto is in the main apparently arbitrary.² The psychical sciences on

¹ To prevent this argument from becoming too intricate we must pass over the distinctions in art generally and in the respective arts individually between the functions fulfilled by actually and those fulfilled by representatively expressive phenomena, also by phenomena and by reminiscent phantasms, distinctions requiring careful handling.

² That the impression of arbitrariness may not really be complete and absolute would seem to be involved in the fruitfulness of hypotheses.

the other hand treat of psychical states and qualities and are not directly and essentially concerned with phenomena in the strict sense. The function of science as regards lower grades of reality is to reach truths that, because their connexion with phenomena is apparently arbitrary, require to be established by verification ; as regards higher grades of reality it is to reach recognisable truth, truth the verification of which, though sometimes very desirable, is not urgently required and is seldom practicable. Since the connexion between phenomena and reality in physical and to a very great extent in biological science is apparently arbitrary, it is not clear thus far why science should show to so great an advantage in comparison with art in dealing with those spheres. The explanation may be expressed in three propositions. First, in spheres where phenomena are unexpressive and the connexion between phenomena and reality is apparently arbitrary the only way to truth is by the verification of hypotheses. Secondly, it is just those spheres in which verification can be most largely, easily, and convincingly obtained. Thirdly, verifying tests can be applied only to explanatory generalisations of a relative kind, that is, to scientific (non-metaphysical) hypotheses, because only in these is a sufficiently simple and clear-cut issue obtainable.

There is indeed one important point as regards which it might be urged that the correspondence clearly fails, and further in failing there fails to a great extent everywhere ; art, it might be said, stands in a relation to reality altogether different from that of science ; we can speak of it, very inaccurately, yet not altogether indefensibly, as an imitation of reality, and the resemblance is at times so close that, especially in the case of certain lower artistic forms, coloured wax figures for instance, we may momentarily take the imitation for actual. That art and science are differently related to reality is of course obvious ; but only a difference that implied a greater nearness to reality of one or the other would affect the argument. At first it may seem that the difference is of such a kind in favour of art ; yet in the writer's opinion a little reflexion will show that this is not really so. Art, which is more individual and particular than science, comes nearer to reality at individual and particular points, but not upon the whole. Thus a painted portrait

But here the question arises how far hypotheses are suggested by phenomena themselves, how far by earlier, perhaps chance discoveries or earlier partly rejected hypotheses. A further point is how far the explanation of phenomena, how far knowledge of reality purely as such is the speculative (not the practical) end.

may be very like the particular face after which it is painted; but from the typical human face, so far as we can speak of such a thing, it will probably, as concrete and complex, differ considerably, even acutely. A scientific principle on the other hand, as abstract and simple, holds equally of all individual instances.

But if art and science are to be considered as normally correspondent in aim and content, as both equally concerned with truth and reality, the need arises of explaining the much earlier development of the former as well as the apparently far more enduring value of its individual embodiments. As regards the earlier development of art, this seems attributable partly to a far smaller dependence upon elaborate instruments beyond the ideas and the resources of early times and upon data not easily procurable and requiring to be sifted very carefully, partly to a more obvious connexion either with the means of achieving necessary or useful practical aims, as architecture with building, "literary" art with language, written or spoken, or else with the skill appropriate to such aims, as "literary" art with persuasive power, or finally with the capacity to afford enjoyment unrelated to the acquirement or possession of truth, a circumstance that largely explains the greater part played by imagination than by reason in primitive cosmological legend, since the uncivilised like the civilised man required diversion and amusement, and for this must, with social functions less differentiated, have looked in part to the makers and shapers of myths.

The other point, the contrast between the enduring value of works of art and the rapid obsolescence of scientific theories and the books expounding these, or, to put the same thing in a different light, between the progressiveness of science and the unprogressiveness of art, is partly connected with the above, but will be best treated independently of it. In the first place then, art is not, in the writer's view, essentially more enduring or less progressive than science, but it is so both apparently and also, in a sense, accidentally. To take the latter point first. The truly, as distinct from the apparently superior progressiveness of science is due chiefly to the extraneous aid given by verification—in the same way those sciences are the most progressive where verification is most practicable. And the cause is obvious; if the distinction between what is correct and what erroneous can be swiftly, easily and certainly established, not only is effort thus directly prompted and stimulated, but much effort that would otherwise have been unprofitably misapplied can be guided into the right channels. Next as regards the

merely apparent difference. The possible analytical problems of science being fewer than the possible synthetic themes of art, it follows that work in connexion with the former is more "intensive" in character. Yet what is gained in depth is lost in breadth. In other words, science advances more through the rehandling of already handled aspects of truth, art more through the fresh handling of untouched aspects. At the same time, the difference must not be overstated. Many of the greatest works of art have been in some sense rehandlings of traditional themes, which themselves have only gradually taken shape and often are traceable ultimately to very crude and primitive notions—consider the enormous development, beginning in the speculations of a culture hardly removed from savagery, that is discernible behind the modern, chiefly decorative use of Greek or Roman mythological figures; there is too a certain amount of rehandling in much, perhaps in most art; further, a tendency to restrict artists to traditional themes has operated strongly during various periods, in some cases of quite extraordinary artistic vigour. All this, it is true, has not resulted in the supersession on any great scale of earlier artistic work possessing excellence of a high order. But, it should be remembered, identity must always be far less perfect in the case of artistic themes than in that of scientific problems. Further, as regards the formative arts, where the tendency mentioned has shown itself most powerfully, every work of art exists in a single and unique material embodiment susceptible of private or public ownership and therefore the supersession of an earlier masterpiece by one later and more mature is obviously impossible in the sense in which one theory may be superseded by another; in the case of sculpture of course casts can be taken, but, possibly to some extent on sentimental grounds, these are not valued in the same way as the originals. It is also probably much more true of art as a whole than of science as a whole that particular phases and types of civilisation offer, while actual, specially favourable opportunities for the observation of particular aspects or portions of truth such as particular personal types (thus one can conceive a twentieth-century Hamlet but hardly a twentieth-century Falstaff), and obviously work done under advantageous conditions of the kind will not easily be surpassed in later ages. At the same time a distinction should be made between the just and the exhaustive treatment of a particular theme. Earlier artists overlook aspects or implications of their themes that would not be ignored in later times, and in this regard it is conceivable that many even of

the finest artistic creations may be transcended by later work on the same lines—on the other hand, enlargement of outlook may involve a lowered intensity of realisation. Finally, the obsolescence, partly due to mere accumulation, of much artistic work not of the first quality, also, on the other side, the permanent interest and value, at least for experts, of much early and even naïve scientific theory should not be lost sight of.

If we consider scientific books rather than scientific theories, there is a further explanation of their tendency to become obsolete. Artistic work, as already said, is always in some sense concrete and the possible versions or varieties of a concrete idea are inexhaustible and each has its own individual worth and significance. Science on the other hand deals with abstract ideas, the differentiation of which is far less subtle and is not dependent upon the precise language used; consequently no particular combination of words is associated with such ideas, which in fact only require to be set forth in words for purposes external to the ideas themselves, as for communication to other persons, and once the author's meaning is grasped, an abbreviated scheme will serve better for many purposes than the original work. Hence, except perhaps as regards an occasional *locus classicus*, no supreme value attaches to the form of a scientific work unless it has high artistic excellence as well, a combination that is difficult and usually impossible.¹ The main qualities required in scientific language are qualities of exposition, notably clearness and precision; an easy flow, with sentences well built up, is a further important advantage

¹ That artistic and scientific qualities for the most part are mutually exclusive will perhaps appear to some a hard saying. We may therefore deal very briefly with one or two facts that might seem to contradict it. Thus the writings of some authors have, it is true, both artistic and scientific merit in a pre-eminent degree, but alternately rather than simultaneously. Again, a great engineering work can hardly afford much scope for art, but it may yet, like a natural form, the human figure for instance, have æsthetic quality, and therefore artistic interest, as manifesting for instance its character or function or the thought and skill of designer and builder; further, engineering science is of course only applied science, that is, it does not, except accidentally, extend our knowledge of reality, it does not explain but merely contrives. In architecture there is certainly more room for the close union of art and applied science; but it must be remembered that alone among the greater arts architecture is always mixed art, that is, has necessarily both an artistic and a practical character: the point may also be suggested that skill in building is often perhaps more nearly akin to art than to science, that good building may proceed and in former times did perhaps mostly proceed from practical intuition into mechanical laws and into the physical qualities of the material employed.

and here and there a more distinctively artistic handling may be desirable; but such qualities, while useful as well as decorative, are not essential in any way.

It should be observed that the contrast between art and science in these matters would necessarily be exaggerated if the consideration of them were restricted to a historical survey. This is because the labours of scientists in the sphere of relative knowledge have from about the time of the Renaissance till quite recently been concentrated to a disproportionate extent upon the lower grades of reality, that is, upon those grades where the problems to be solved were, if abundant, yet in comparison less numerous, where the opportunity for verification was most ample, where even verification itself has had a conspicuously progressive character owing to constant increase of data, improvement in methods and invention of more efficient instruments, where, in consequence of all this, progress, real or apparent, has been most conspicuous.

On the further question how far mutual help, of which there has not been very much so far, may be possible in the future a single observation must suffice. Mutual influence has dangers as well as advantages; thus it has been maintained that knowledge of anatomy is injurious to graphic art as strengthening the natural inclination to represent what is known as well as what is seen and so impairing the "innocence of the eye".

It may be worth noting that certain of the points which have been urged here in relation to art and science can be given a yet larger application. First, the distinction between relative and absolute truth, a distinction already extended from science to art, admits of being extended again through a similar argument from the ideational (the contemplative and speculative or, to combine original and present meanings, the theoretical) to the practical sphere; that is, in the latter sphere too there are both those who for the most part remain on the plane of relative truth, where there is much taking for granted—or, often, ignoring—of fundamental meanings and values, and those who have a greater capacity for penetrating to the hearts of things. At the same time the practical worker is concerned with means rather than ends; he is less a seer or a discoverer than a contriver, immediately busied not so much with the nature as with the plasticity, the possibilities of reality; his true function may be described as the actualising of the ideal, a function requiring a just sense alike of the practicable ideal and of the pliable actual. Again the distinction between the reasoning or abstract and

the intuitional or concrete mode of thought, which in the ideational sphere was associated with the distinction between science and art, seems to hold good also in the sphere of actuality, of practical affairs; this, if admitted, involves the rejection of the usual tripartite division of thoughtful activity as artistic, scientific or practical. Finally, the classification of the sciences, which appeared to be applicable—with qualifications—to art as well as to science, in other words to hold good in the ideational sphere generally, may be extended—again with qualifications—to the sphere of actuality also, that is, men's practical activities may be classed as chiefly sociological, psychological, etc., though obviously the same kind of activity, whether reasoning or intuitional, may have very different importance in the world of actuality and in that of ideation, the chief cause of such want of correspondence being the unequal and fragmentary way in which, from the constitution, and development alike of the physical world and of civilisation, reality in its practical aspects interests and appeals to mankind.¹

¹ Perhaps no point in the above long argument is likely to obtain less acquiescence than the statements, opposed, so far as the writer knows, not only to common-sense opinion but to the universal opinion of metaphysicians, psychologists and writers on art, respecting the relation of art to emotion. The writer may therefore be justified in returning here to the point and trying to estimate quite summarily the place of emotion in human nature. In his opinion, just as thought is a conscious activity of mind, so emotion is a conscious activity of psychical existence. But obviously not all emotion is æsthetic. Nor again is all non-intellectual psychical activity emotional. We must first distinguish here on the one hand sentiment and emotion or "feeling" (which need not for present purposes be distinguished from emotion) and on the other intent (or aim) and effort, while knowledge and thought occupy a mediate position between these two kinds of psychical condition and activity. Further, to complete the constitution of human nature we must add all bodily, that is, all vital or physiological characteristics and finally the power of self-determination or self-conscious choice. The relations and interaction of these various elements are, it is obvious, extremely subtle and complex; one or two remarks must suffice here. First, the function of thought is in ordinary views unduly circumscribed not only in relation to art but generally. To take two fairly simple instances. A "sense of honour" is not usually regarded as intellectual, yet it would seem to consist very largely in a right understanding and appreciation of certain moral obligations and proprieties—of course the extent of such understanding and appreciation depends partly upon the extent to which one acts according to one's "lights"; again, determination in the pursuit of an object may really be due less to characteristic masterfulness than to an intense practical and, if one may style it so, pragmatic, though not necessarily well-founded idea of, for instance, its gratifying or its beneficial potentiality—such perhaps is the case with Lady Macbeth. And thought is often perhaps of a much more subtly implicit and "instinctive" kind than is indicated in these examples. Next, somewhat as the

term "emotion" is used also for the imaginative or intuitive insight from which emotion of the æsthetic kind results, so the term "will" is used not only for self-determination but also for intent and effort, which, though quickened by an exercise of self-determination, are in themselves distinct therefrom. Again, it must not be taken that the writer assigns a low value to right sentiment and emotion, which seem to him to have an ampler range and a reference more directly social and to be more in the nature of ends in themselves than qualities of "will" or "character" like determination, endurance, "grit". At the same time if the appeal of art is chiefly to emotion and that of science chiefly to thought, the inferiority of art at least to a priori science would be difficult to disprove.

V.—A DISCUSSION OF MODAL PROPOSITIONS AND PROPOSITIONS OF PRACTICE.

BY RAPHAEL DEMOS.

I SHALL begin with the consideration of modal propositions expressing possibility, probability, and necessity. I propose to examine immediately the form of such propositions, offering in the end a definition closely analogous to the one which I have offered with reference to negative propositions in a recent number of *MIND*.

If we agree to designate propositions such as "There is a God," "X is attending to his work," "I shall be there at ten"—that is, propositions which obviously assert fact—factual propositions, then it is clearly true that modal propositions are sharply in contrast with factual propositions. Examples of modal propositions would be, "There must be a God," "X is probably attending to the work," "I may be there at ten," where nothing factual seems to be asserted. Again, in explaining, upon going out, that I am taking my umbrella along because it might rain, or because rain is probable, I am taking account of a situation which may be characterised as a risk (the probability or the possibility of rain), but which does not imply rain as a fact. For, it may turn out that no rainfall occurs during my entire walk; yet my precautionary measures remain justified, for the risk of rain was there even though rain was not present as an event. Consequently, modal propositions are, on their face, so far formally different from factual propositions as to determine reference to a type of being (which may be called 'modality') in no way identifiable with fact or existence.

Undoubtedly, commonsense balks at this point; empirically speaking, only two alternatives are open as to a thing's existence: either it exists or it does not exist, and there is no *tertium quid* of possible existence. To borrow an example from Bradley, suppose a ship has sailed from Liverpool for New York. Then we say, it *may* be in New York and it *may* be at the bottom of the sea. As a matter of fact, the ship is somewhere—and being where it is, it is not *possibly* where it is. The external world contains only the actual fact of its

being somewhere, and the possibilities expressed by the above modal propositions do not seem to correspond to objective reality. So with necessity, conceived as a modification of being. Whereas possibility appears to qualify a thing as less than real, necessity appears to qualify it as more than real. Yet within experience we discover nothing which is either short of or over and above reality. Accordingly, rather than adopt modal propositions in their given form and be compelled to posit a type of being which experience refuses to recognise, it seems preferable to apply to them a special interpretation which would exhibit such propositions as referring to the familiar world of things and facts and which would thus render unnecessary the extension of the world of reality beyond the bounds of existence *per se*. An interpretation of this sort would possess claims of preference on the score not only of empirical evidence but of logical convenience as well, in that it would tend to simplify matters by a prudent use of Occam's razor.

The problem now before us is this: how interpret modal propositions in a way which shall present them as referring to no other field than that of the factual world. The popular mind and even philosophy have been prone to the view that 'possible' may be defined as the absence of the actual, *i.e.*, as identical with any class of things of some sort which is null, —in simpler language—with what is not. Such a view is uppermost in the mind of Bergson when, defining the future as what is not and the present (along with the past) as what is, he restricts the scope of possibility entirely within the limits of the future. Commonsense, too, tacitly grants the same view when, after things have come about in a certain way, it declares that once they have come about like that, it is not possible for them to have happened otherwise, and thus opposes the possible to what is.

Yet the belief in question is untenable, for what is declared to be possible may be actual as well. With reference to the prisoner at the bar, I judge: "that he is guilty and that he is not guilty are the only alternatives possible". Inasmuch as one of these alternatives is necessarily realised in fact, it follows that one of the above possibilities is an actuality as well. Consequently, the definition of possibility as a function of actuality, more particularly, as the absence of it, is inadmissible.

Analogous considerations apply to probability. It is perhaps true that probability is expressible in terms of a ratio; thus, we say that the probability of X's possessing the property *a* is two to five. One might conceivably interpret this

to mean that of any five cases of X , two are such as involve a ; in this way one would be defining probability as the expression for a certain relation among actual things. But, of course, this is not true, and the doctor who informed his patient that he was bound to recover since ninety-nine cases of the same disease had already proved fatal in his hands, and since one per cent. of such cases are known to recover, was patently wrong. In the ratio which expresses the amount of probability, the terms are variables and only the relation is a constant, hence, the fact that a certain ratio holds true does not imply that it holds true within a collection of a particular number, *i.e.* as a relation between groups of given objects. The reflection might occur to some one that the ratio, though not realised in any finite collection, is realised when the collection is large enough to be infinite. Thus Venn (*Logic of Chance*, p. 146) maintains that every chance is realised in the *long run*, the long run being, I presume, the totality of events and apparently infinite. This consideration cannot be maintained, because the term ratio has no meaning in the field of infinite collections, and, in general, the ordinary arithmetical properties of number do not obtain in such a situation. In sum, probability cannot be properly construed as a relation between groups of data, whether the collection considered be finite or infinite.

Modality, then, is not to be interpreted as a function of the actual. No more is it correct to interpret it as a function of the judging subject, say, of the amount of knowledge which the subject possesses about the objective situation. It is in perfect order to *debate* the question of the possibility of an event, and whether a certain event is probable or not is a matter to be settled only by a consideration of the relevant evidence. Naturally, there is a reflection of the objective situation in the subjective attitude, and a proposition which is necessary is believed in with a great measure of conviction, but it is the former that determines the latter, and the nature and strength of my conviction vary as functions of the degree and nature of information that I possess about the situation.

I have attempted to clear the ground before taking up the constructive part of this discussion, and now I proceed to formulate the view about modal propositions which I believe to be true. Take a phrase such as "possible war" as it occurs in any wider context, say, in the proposition "America must prepare for possible war," where it looks as though there were reference, in terms of the phrase "possible war," to some objective entity. Being a descriptive phrase, the latter asserts existence implicitly, and, stated explicitly, is of

the form: "there is a possible war, or, a certain war is possible" (and America ought to prepare for it). Now, it must be at once pointed out that possibility is not a predicate of the object 'war' in the proposition in question, for, after all, a possible war is no different from any other war. Possibility is, in fact, a qualification of the whole existential proposition "there is war," and what one means in using the proposition is not "there is a possible war," but "it is possible that there be war". So, too, the proposition "we may win the battle yet" is really of the form "it is possible that we win the battle". We are thus led to the view that possibility is a function of the entire content of the proposition in which it occurs. The same is true of probability. A phrase, such as "probable rain" put in propositional form without further scrutiny, would appear as "there is probable rain" where probability seems to qualify rain. It is obvious that this is not the case, and the more correct view is to the effect that probability is a function of the entire propositional content; accordingly, the above proposition should read "it is probable that it will rain".

The question now may be raised as to the nature of the modification of content brought about in terms of possibility and probability. In short, are possibility and probability attributes or are they relational qualifications, like 'father of' or 'square of'? Evidently, relational qualifications. With reference to a given proposition, probability may change when the situation changes. "That the patient will recover"—which was probable yesterday—may not be probable to-day. Thus, probability must express a relation on the part of the proposition of which it is the qualification to *the character of the objective situation*. In other words, a proposition is probable, not as such, but *on the data*. Possibility, too, expresses a relation on the part of the proposition which it qualifies to the objective situation, and I judge that war is possible upon the basis of my opinion on the state of affairs. There is, thus, a correlate implied in any proposition expressing possibility or probability, namely, the term "nature of the situation," or "state of affairs," and by making explicit what is implicit one changes the appearance of the proposition accordingly. *E.g.* given "war is possible" (in the proposition, America must prepare for possible war) we have really "the state of affairs is such as to render the existence of war possible," and the whole proposition should read: "the state of affairs is such as to render the existence of war possible, and America should prepare in view of it (*i.e.*, the state of affairs)". Again, given the proposition "rain is probable,"

we have really "the data are of such a character as to render the event of rain probable". Now, what I have just designated "the nature of the situation" or "the state of affairs," or "the character of the data," is nothing else than the proposition true of the relevant facts ("what we know about them"), and the above statement might also read: "the proposition true of the facts renders the existence of X possible or probable," or again, "a certain proposition is true which renders, etc." It is obvious that propositions asserting necessity are subject to the same interpretation, so, without further ado, I venture to state the general conclusion that modality is a relational function of propositions, and that a modal proposition of any sort is of the form: a certain proposition q is true which renders a stated proposition p possible, probable, or necessary.

In view of these considerations upon the structure of modal propositions, I shall now suggest a general definition which may cast light upon some problems that occupied us earlier in the article. Any true proposition (for that matter, any proposition) may sustain a certain non-symmetrical, transitive relation to other propositions,—a relation which I shall call implication.¹ Implication is a relation such that when p implies q , one may infer q from p . The relation admits of degrees; it may be probable implication, thus yielding probable inference; it may be necessary implication, yielding the geometrical or canonical type of inference; finally, it may be such as to render the inference merely possible. Now, any true proposition which sustains a relation of implication to some other proposition may be so described, and all modal propositions constitute precisely descriptions of some true proposition in virtue of the relation of implication which the latter holds to the proposition stated. The proposition "to-day we shall probably stay indoors" is really of the form "the state of affairs is such as to render our staying indoors probable" where one is describing the state of affairs, namely, a proposition true of the facts, say, "that the weather is going to be bad". Again, in the proposition "America should prepare for possible war," America is urged to prepare in view of the state of affairs which renders the existence of war possible, namely, the fact of internal or external trouble.

By thus subsuming modal propositions under the category of descriptions we solve important difficulties. A modal

¹ The term implication is used arbitrarily in this connexion, but no better one is available for the purpose in hand.

proposition, like any other description, is an incomplete symbol in the form in which it is ordinarily stated, and its apparent object (possibility, probability, or necessity) is a fiction. It must be so interpreted as to involve the assertion of existence, in this case, the assertion of the truth of some proposition. Thus, " p modally" is transformed into "a certain q is true which implies p ," where the reference is to a true proposition, and hence, ultimately (since a proposition asserts fact) to fact. And furthermore, modality, as a term, is transferred from the field of objects to which reference is made to that of relations among propositions, and it now is seen to function as a descriptive term in the complex in which it occurs.

To recapitulate the results of this inquiry, I have analysed a modal proposition into the form "a certain proposition q (where q is a variable term) is true which implies a certain proposition p (where p is a constant term)," and I have defined it as a description of some true proposition in terms of the relation of implication (in any one of its forms of possibility, probability, or necessity), which the latter sustains to some other proposition. Doubtless this inquiry leaves a number of problems connected with modal propositions unsolved, chief of which is the question as to the conditions which determine the relation of modality among propositions; when is the relation one of 'bare' possibility and when is it one of 'concrete' possibility; whether probability is further analysable into simpler elements, whether it can be stated numerically, and what are the determinants of its amount. All these are problems important indeed, but not directly pertinent to the inquiry or essential to the conclusion, and hence will not be dwelt upon in this article.

I shall now take up propositions of practice, that is to say, propositions such as "You ought to know better," "X should see the doctor at once," "Y had better buy a new suit of clothes". Prof. John Dewey has pointed out (*American Journal of Phil. and Psych.*, 1905, pp. 505 ff. and 533 ff.) that such propositions do not refer to anything *given*, to any fact; thus in asserting that X ought to visit the doctor, one is not stating what X is doing, or what the matter with X is. Apparently such propositions constitute a class formally different from that of factual propositions, and correspond to a type of objects incommensurable with that of things or facts; as Dewey says, they imply a type of being which is an incomplete and consequently an indeterminate situation, —'doing' rather than 'being,'—the propositions themselves

indicating the manner in which the completion is to take place. In what follows, I shall contend that it is not necessary to assume a distinct type of being of this sort, and that through the application of a special, and, from the point of view of experience, very natural interpretation to propositions of practice, it will be made to appear that the world of reference for such propositions is ultimately the familiar world of things and facts or events.

Consider a proposition such as "X ought to visit the doctor". Now, the place of the term "ought" is really before the rest of the proposition; in other words, "ought" is a function of the entire content of the proposition. What one means by the above proposition is "it is good (or proper) that X visit the doctor," or, more colloquially, "a visit by X to the doctor is a good thing". By this treatment, "ought" is made to appear as a "value-predicate" for the proposition as a whole. Similarly, the proposition "One should respect other people's feelings" is, more properly, "It is needful that one respect other people's feelings," where "should" occurs as a qualification of the proposition as to respecting other people's feelings. Generally speaking, all propositions of practice are expressions in which a value or 'ought'-predicate is attached to a given proposition.

But we must carry the analysis a step further. A given proposition may validly possess different value-predicates under different circumstances; thus, to-day it is worth while that X should visit the doctor; to-morrow, it will be worthless, since too late. In other words, the proposition alters its value-predicate in relation to the nature of the situation, and consequently goodness (rightness, propriety, needfulness, etc.) is a relational term, and its presence in a complex implies the presence of a referent as well, such being the expression "the nature of the situation". Thus, I assert that X should buy a new suit, *under the circumstances* (i.e., because the suit he now wears is worn out), and given the statement, "it is needful that X buy a new suit," we have really "the state of affairs (as to X's clothes) is such as to render his buying a new suit needful".

To recapitulate, (a) the ought-predicate is a function of the entire proposition in which it occurs, (b) it is a relational function, and hence its occurrence implies the occurrence of another term—its correlate—in the same complex, namely, the phrase: "the nature of the situation," (c) since one may know a value-proposition without knowing what factor exactly in the situation necessitates the action urged (as when one is informed of the proposition), the phrase "the

nature of the situation" occurs in the proposition as a variable, that is, without specification. Summing up, given a proposition of practice, we have really a proposition of the form, "the nature of the situation is such as to render this or that act proper or good". But the 'nature' of any situation, expressed in terms of the vocabulary of epistemology, is the *proposition* true of it, and hence a proposition of practice may be said to be of the general form "the proposition true of fact renders a certain act good," or, "a certain proposition *q* is true which renders a certain proposition *p* (content stated) needful or good".

I shall now consider the following question: The above point as to form being granted, how must propositions of practice be characterised? The reply is, as descriptive. A true proposition may sustain to other propositions a certain non-symmetrical, transitive relation which I shall call "demanding," "requiring," or "necessitating". The propositions toward which this relation may be sustained are generally "modes of action," that is, propositions asserting facts of the nature of an *act* on the part of some individual or individuals. One might thus say, "the fact that the harvest this year has been poor necessitates that the country should import grain from abroad," where the relation of necessitating obtains between the two propositions (as to the poor quality of the harvests and the importation of wheat, respectively), the second of which describes a certain mode of action. Any description of an object is achieved through reference to some function of the object, and a proposition of practice is precisely a description of a certain true proposition by the fact that it sustains the relation in question to some proposition asserting action.

Thus, the proposition "wheat ought to be imported" is a description of the "state of affairs" (which is a proposition true of the facts, *i.e.*, "that the harvest of this year has been poor"), by the fact that it necessitates that wheat be imported. Accordingly, instead of the assertion, "the harvest of this year is poor" we may have the assertion "a certain proposition is true which requires that wheat be imported into the country (or renders the importation of wheat into the country needful, or proper, or good)". Inasmuch as it is understood that one is referring to the proposition true of the situation, mention of the fact is omitted; the correlate being thus dropped, the relation (of requiring) assumes the form of an attribute; we then are left merely with the statement: "it is needful that wheat be imported," or "wheat should be imported"—the familiar form of all propositions of practice.

Hence, a proposition of practice is definable as a description of a true proposition in terms of the relation of requiring or necessitating, etc., which it sustains toward some other proposition referring to a mode of action. Like other descriptions, it is stated incompletely, *i.e.*, it is an incomplete symbol, and its apparent object, "doing," "becoming," etc., is fictitious. Stated fully, it constitutes reference to the proposition true of fact, and hence, indirectly to the world of fact; thus the 'ought' element enters merely as a relational term serving to describe the object referred to, and not at all as an object of reference itself.

In a previous article in MIND to which I have already had occasion to refer, I defined negative propositions as descriptions of true propositions in terms of their opposition to some other proposition. Joining to this observation my remarks in the present paper, I desire to call attention to the following points about all three types of propositions, negative, modal, and practical.

(a) The adequacy of the concept of description as developed by Mr. Russell within the field of the types of propositions in question. All of the latter, respectively, give the appearance of introducing us to new modes of being such as negative facts, possibilities and probabilities, and doings or becoming. That such modes of being are illegitimate is suggested by first impression and is confirmed by more detailed investigation. Now, by defining these propositions as descriptions, and hence, in their apparent form, as incomplete symbols, we are enabled to apply the philosophic razor to the thread which joins these supposed objects to reality, and by an appropriate interpretation of the propositions we are permitted to exhibit them as referring to true propositions, and hence indirectly to facts.

(b) The rôle of propositions as terms of reference. A factual proposition asserts—refers to—fact; in this sense, it may be characterised as a description or a sign of fact. Hence, negative, modal, and practical propositions, *qua* descriptions of propositions, may be defined as descriptions of descriptions, as signs of signs, or, in old-fashioned terminology, as ideas of ideas. Here we have definite use of the rather unfamiliar notion of reference to propositions, as contrasted with reference to given things or facts. Thus, from the point of view of knowledge, given any assertion of a proposition of the types in question, there is a relative emancipation from the "external world" and a restriction to the world of "content," or, of propositions, as the field of reference.

VI.—CASSANDRA'S APOLOGIA.

BY F. C. S. SCHILLER.

WOE is me, alas, alas! Oh that I had never met you, or had never gained from you the baleful gift of prophecy! Oh that these eyes might once more be blind to the impending doom of sacred Ilium and the fall of Priam's kingly house! Surely it is better for mortals not to get what they most desire nor to have prescience of the future they seek to know so eagerly!

Yes, my dear Cassandra, I thought you would soon begin to regret the way you tricked me. But it is no use your making up to me now. Your repentance is too late. The gifts of a god are irrevocable, and even if I could not change the past. You will continue to foresee the evils you will be powerless to avert.

Woe is me, what shall I do?

You had better betake yourself to a wholly contemplative life, and devote yourself to the prevision of eternal truth which you are privileged to behold. I admit that the life of action is more fun, but I sometimes think it would be better, even for us gods, to become just contemplators of all time and all existence and to cease from interfering with the order of the world, whether to reward or to punish mortals. Anyhow the vision of Truth should be enough for you.

Even though it makes me wretched?

Not all visions are beatific; or rather the vision of a god alone is that. But this you would not see when you beheld me. So it serves you right. You are justly doomed to foresee the hideous truth, but whatever you predict, it will never be believed. Hence your prevision will be vain. If that annoys you, as I see it may, you can become indifferent to what is fated, and take delight merely in your prescience of it. That is how we gods, and Professor Alexander, 'enjoy' whatever happens.

But how can I, being mortal, become indifferent to mortal woes?

That is your look-out. I am merely telling you that you can make your prescience painless and your life endurable by imitating me. After all, as you can now no doubt foresee, I am merely telling you, what Aristotle is going to prove, in another 1000 years or so, that the best life for mortals to lead is that which apes that of the immortals as far as may be, however vainly.

No, I will *not* imitate you. You are horrid. I would rather

die a thousand deaths than live like you. I detest you, and I do not believe a word you say! Why should I believe the atrocious vision you have conjured up before my eyes by some unholy magic? How do I know it is true? How do I know that you have not been trying to deceive me in this matter also? How do I know your gift is not an illusion and your promise false?

When a god swears by Styx his promises are kept to the very letter. If you will not now believe me, you will have to later on. See, and wait, until what you have seen has come to pass.

What precisely has been promised me? Do tell me again; for at the time I hardly grasped what you said.

I promised you that whatever you prophesied should come true, but, to rebuke your insolence, I added that, whatever you prophesied, no one should believe you.

I can understand that at first they might not believe me, if I prophesied unpleasant things. Men are always reluctant to believe in the coming of evils, especially if they themselves have brought them about. But if my prophecies came true and they had frequently experienced this, how could they help believing?

They would not, I tell you, however often you succeeded. Experience would make no difference.

How is that possible?

They would be under a necessity of thought, stronger than any fact, to think that false which you had asserted to be true.

But would not that be belief in necessary error? How very strange!

No stranger than the belief in necessary truth.

Well it seems to me very queer. But tell me, Apollo, should I be under the same necessity myself? Should I too think false what I myself had prophesied?

I had not considered this point—which would you prefer?

I do not think that you need consider *my* feelings; the point is that whatever you say *you* will get into a difficulty.

Nonsense! How?

Well, unless I too did not believe that what I said was true, you would be convicted of having promised falsely, and this you swore by Styx you would not do. For it would not then be true that no one at all believed what I prophesied. You will have therefore to make an exception in my favour.

I will do no such thing. I had better say that what you prophesy will be true whether you think it so or not, and so even if you think it false. For your thinking it can make no difference to the truth.

That sounds well, but I am not so sure about it. At any rate, I wish you would tell me how I can at the same time both believe that what I prophesy is false and know that it will come true?

Is not belief different in kind from knowledge? You *know* the truth, but *believe* the false. Where then is the difficulty?

'Knowledge' only seems to me to be a confident belief that is not doubted: I wish therefore that you would prove to me what is the difference between them and how a belief may be known to be knowledge.

Gods never prove anything; it would be most undignified. They only speak with divine authority. If you want proofs you will have to foresee those of Plato, the divinest of philosophers, or the most philosophic of divines, and moreover (probably) a son of mine!

That does not satisfy me, but before I inquire further, let me thank you for the great privilege your gift bestows. I shall now be able to lie as much as ever I please. It will be great fun.

What do you mean?

Did you not say that whatever I said should come true?

I did.

Well then whatever I say *thinking it false* will come true nevertheless?

Certainly.

Then I can *lie* with entire impunity.

I do not understand you.

Pardon my lapse into our barbarous Phrygian. But I do not think there is any Greek word to express what I meant, namely to say what is false willingly and knowing it to be false. Do you not see what an enormous difference this makes?

I do not see that it makes any. What you say is either true or not, whatever you think about it. There is no third possibility, is there?

I suppose not.

You seemed to me therefore to be speaking nonsense when you said just now that you would be able to prophesy false things as much as you pleased. You could not prophesy falsely. You could only prophesy truly. It would be impossible for you to utter what you call a 'lie'. Nor could you do so with impunity; you would always be punished for spreading false news—because no one would believe you.

What an intellectualist you are, Apollo! I am afraid that though you are a god and love some Trojans, you are very Greek at bottom. Are you not entirely leaving out the speaker in arguing about the spoken word? Do you really think it makes no difference what *he* thinks about the truth or falsehood of what he says?

Most certainly. None at least that it is reasonable to take account of.

Then you think it makes no difference whether I prophesy what I believe to be true or what I believe to be false, if only it comes true? Nor again whether I prophesy what is false voluntarily or involuntarily, so long as it does not come true?

In either case the true is true and the false is false.

Then you do not care whether an error is voluntary or involuntary?

I care only whether it is great or small.
And you do not resent the attempt to deceive you which the liar makes?

Whoever speaks falsely deceives me, if I believe him.

You are at any rate a consistent intellectualist, Apollo.

The reasonable are always consistent.

Ah, but are the consistent always reasonable?

Being a woman, Cassandra, you naturally do not admire the logical virtues.

At any rate I should like to ask your opinion about a further question.

What is it?

Have you not given me the power in certain cases to make what is false true, simply by declaring it true, and in others to make it true, by declaring it false?

Why should I listen to such nonsense, seeing that not even a god has the power of making the false true?

If you will listen nevertheless, you will I think understand my difficulty. Is it not possible to tell a sick man he is going to get well, without believing this?

Certainly, even my son Asklepios often says this.

Well then, may not the giving of this assurance sometimes so encourage the patient as to enable him to recover?

Possibly.

Yet he would have died, if he had not received this assurance?

Probably.

Then the assurance being false would have made true what would otherwise have been false, simply by declaring it true?

My son would say it was not by his assurance but either by his superhuman skill, or by a miracle, that his patient was cured.

Again, may not a wicked physician frighten a patient to death by telling him he is certain to die?

If he is fool enough to believe a doctor!

Nevertheless in this case too his belief will make a difference to the truth.

I suppose I can escape from admitting this by telling you that all is fated and no man can escape his fate.

Is that what you are going to tell me?

No, I had rather let you go on.

Very well then, do you not think that if you prophesied that the harvest will be bad, or again that it will be good, and if men believed you, the price of food will be raised or lowered in the markets?

I dare say, but you cannot expect a god to concern himself with market prices.

But you say you are concerned about the truth, and in all these cases the truth does seem to be affected by what men believe about it. The belief that something will happen seems to make it happen, or else to make people take measures to frustrate it.

At any rate, Cassandra, *you* cannot make things happen in this way. For whatever you say you will not be believed.

I cannot perhaps make the false true by declaring it true and getting men to believe it true. But does it follow that I cannot make the false true by declaring it false and so getting men to believe it true?

I should think it did. If you cannot make the false true by declaring it true, how can you by declaring it false?

You must remember that you have promised me that I shall always be disbelieved. Hence by prophesying one thing I can make men believe the opposite. If I prophesy a scarcity, they will believe in an abundant harvest; so they will sell me their corn, believing that the price will go down. But as the harvest will be bad, I shall be able to re-sell it for much gold when my despised prophecy comes true. Thus I shall be able not only to make that come true which I believe to be false but declare true, but I can also get the others to believe true the opposite of this which I shall seem to them to have declared false.

I did not understand. Only a devil, not a god, could follow all this.

Surely, Apollo, my point is simple enough for a child to follow. If whatever I predict is disbelieved, I can in certain cases foresee that what will be believed will be the opposite of what I predict. I know also that what all believe is false. If therefore I act *as if* what is universally believed true is false and *as if* what is believed false is true, I shall be prepared for what will happen, and can guide my life by always behaving as if that were false which all believe to be true.

Such was not the use I intended you to make of my gift.

Perhaps you did not understand what you were doing, and do not understand even yet what I am intending to do.

I understand at least, that you intend to set at naught the punishment I inflicted.

Does it come to so much as that?

Yes, for by acting as if what you believe true were false, and what you believe false true, you would be escaping all the evil consequences of your false beliefs.

Well, why shouldn't I?

Because it makes me doubt whether you really believe the false things you say you believe, and disbelieve the truths you predict.

Why should you disbelieve what I say?

Because you *act* so differently. And I suspect that your acts are better witnesses to your beliefs than your words. For it is easier to deceive by words than by deeds.

It seems to me, Apollo, that you are now speaking like a pragmatist.

What is that?

Oh, something that no one will understand for ever so long, for another 3000 years at least. And when they understand it, men

will say that it is nothing new and that they have always been pragmatists.

Then talking pragmatism must be very like talking prose. I remember I once asked Momus to tell me what that meant.

And he replied, I suppose, that it was what you always did, especially in your oracular hexameters?

Your impertinence equals his. Have you already forgotten the woes that are in store for you? If so, may I trouble you to turn your prophetic eye upon your latter end, and to foresee by what a death you are fated to perish? It is better for mortals to meditate upon such things than to bandy words with gods.

It is easier at any rate. But I was not unaware, even before my eyes were opened, how piteous is the lot of mortals. I shall suffer as bravely as Prometheus. And I divined also that you gods were merciless and had no human feelings. That is why I spurned your 'love'.

Like the silly girl you are! Had you not done so, you might have escaped from the doom of Troy. Had you continued to please me, I might have made you an immortal, or if not, at least have turned you into an evergreen, like dear Daphne, which is the next best thing.

I had no thought of escaping my doom. But do not you gods too think of your future?

No, of course not. We live lightly, in the present, knowing that the future holds no terrors for us.

Then the fate I shall prophesy will be news to you?

If it is new, it will not be true.

Nevertheless it may be unpleasant.

Nonsense.

Shall I prophesy?

If it amuses you.

Well then I prophesy that you too will be changed—into a butterfly, Apollo,¹ but will still remain Parnassian, and haunt the mountain tops.

Do you expect me to believe that?

Certainly not; but it will come true. However it may console you to learn that you will still be beautiful.

Thank you for that! If I believed you, I should say that so long as I remain beautiful I am still Apollo. And I suppose that even though I became a butterfly on Parnassus I should still remain a god on Olympus.

There will be no gods left on Olympus and the rest will fare worse than you.

I must say, Cassandra, that though of course I know your prophecies are jokes, they are in the worst possible taste. Go home to my temple and devote yourself to your priestly functions. I am sure my sacred image has not been dusted for a week.

¹ *Parnassius Apollo.*

VII.—DISCUSSION.

"ACTIVITY"—A VITAL PROBLEM.

THE term "Activity," so often on men's lips, has not yet received that full attention which its importance demands. Bradley comments on this fact in *Appearance and Reality*. Here is a topic meriting most patient consideration on the part of philosophers. Nevertheless too many writers use the word "activity" as if the meaning associated with it were too obvious to need defining. Thus in Prof. Merrington's recently published and interesting work, *The Problem of Personality*, the "self-activity" of the "Ego" is one of the author's most cherished beliefs; the reader is not allowed, withal, to perceive clearly for what the verbal symbol, treated with such respect, actually stands. What Eucken means by "activity" seems equally obscure.

The time has come for a searching discussion elucidating this concept. Consider the conflicting interpretations of "activity" which such writers as deign to consider it offer us. Some, *e.g.*, say that "Activity" is a way of thinking which implies time-succession; others deny that time-succession is necessarily involved. Some treat it as a subordinate and even 'contradictory' category of *finite* thought; others hold that it indicates the character of Total Ultimate Reality; that, when we use it, we are asserting truly about that which is independent of our thinking, that which is presupposed by the possibility of assertion itself.

In Kant's *Critique of P.R.* "Activity" does not show in the familiar table of Categories; it is a deduced or derived pure judging concept subordinate to the much-discussed category of Causality. This view makes "activity" valid only *within* experience, as this latter is understood by the narrow idealism of Kant. But a grave difficulty confronts the Kantian. Kant's attitude *presupposes* a "synthetic activity," shaping the discrete primal 'manifold' into our category-shot unified experience. "Activity," then, is not merely a category valid *within* experience—it *lies somehow at the very roots of it!* In the Hegelian system "Activity" is a subordinate category or thought-determination comprised within the organised totality of "Reason"—the IDEA. But the trouble is that this IDEA strikes one, not merely as *comprising* the category, but *as itself, throughout its entire extent, active!* It accomplishes, we learn, a "labour of creation," and we are told also in the *Philosophy of History* that the IDEA is at once the "substance" and the "infinite energy" of the Universe, since Reason is not so *powerless*

as to be incapable of *producing* anything but a mere ideal, a mere intention. The IDEA, indeed, is the "absolutely *powerful* essence". Utterances such as these carry us back to the Leibnitzian contention, to wit that all that is real *acts*. The Hegelian IDEA, it would seem, is a philosophical instance of ἐνέργεια ἀκίνητος; that phrase which Dr. Schiller has revived and used with excellent effect to denote "activity" which is unaccompanied by real change.

An important legacy bequeathed by Fichte to modern thought is an idealism which (does not merely deduce a category of "activity," but) *rests utterly on a cosmic "infinite activity"*. Fichte's view was suggested, perhaps, by the defect in Kant's thinking previously noted, viz.: that Kant's entire account of experience presupposes "activity" which cannot, therefore, be regarded as a thought valid merely *within* finite thinking. Fichte, in fine, regarded "activity" as basic; a fact which must have borne fruit in his later inclination to treat the Ground of appearances as *Will*. This *Will*, which we meet again in the works of Schopenhauer, is ἐνέργεια ἀκίνητος; neither Fichte nor Schopenhauer favouring the view that change or time-succession is a mode of Ultimate Reality.

Dr. Schiller has supplied us with an interpretation of "Activity," which cannot be overlooked, in his monadist pluralism of *Riddles of the Sphinx*.¹ I have furnished another in connexion with the hypothesis that the Ground of appearances is best discussed as *Imagining* (*World as Imagination*, p. 187 *et seq.*). Both interpretations regard the Universe as activity, "a sum total of Actions and Activities" as Carlyle, influenced by Fichte, called it. The concepts differ considerably with the differing contexts to which they are applied, and in which alone they possess meaning. Both are submitted simply as experiments such as serve to justify Pragmatism when used as a Method; are truth-claims proffered for 'testing' and to be discarded at need without ceremony?

I have nothing fresh to say about "Activity" in this letter. My main wish is to draw attention once more to the opinion of Bradley that "Activity" has not received that full treatment which is due to it from philosophers. Seeing that this concept lies at the base of several historic systems of thought and is certainly of importance, as interpreted by enterprising spirits in our midst to-day, attempts to elucidate its meaning seem desirable indeed. At present we can note writers who condemn Leibnitz' appeal to "Activity," and yet others who follow Leibnitz and Fichte in treating the concept as fundamental. Are we prepared to pass final judgment on the rival contentions?

¹ Another great pragmatist, William James, has dealt with "Activity" in his *Problems of Philosophy*, less ambitiously. James considers that the word has no meaning outside our experiences of "process, obstruction, striving, strain, or release". Schiller, on the other hand, regards "Activity" with the wide metaphysical interest of a Leibnitz or Fichte as presupposed by the total experienced cosmic process.

VIII.—CRITICAL NOTICES.

On Causation and Belief. By CHARLES A. MERCIER, M.D.,
F.R.C.P., F.R.C.S. London: Longmans, Green & Co, 1916.
Pp. xii, 228.

"EVERY one," says Dr. Mercier, "has an approximate notion, good enough for most working purposes, of what is meant by causation and by cause and effect, but no one has been able to put that notion into a verbal expression that will stand criticism". Dr. Mercier's chief aim in the present work is to supply this lack—to "define causation in consistent and intelligible terms". His procedure is partly critical and partly constructive. In chapter i.—"Some Theories of Causation"—he gives a somewhat perfunctory consideration to views of Hume, Mill, Mr. Welton, Prof. Pearson, Mr. Bertrand Russell and Dr. McTaggart, and disposes of all of them except Mill in a summary fashion. Chapters ii. to vii. are chiefly occupied with attacks on Mill's account of Cause, Effect, Condition, Causation, the Methods of Experimental Inquiry (the *pièce de résistance*), and the emendations which Dr. Mercier offers. He proposes to define causation as the Relating Relation between cause and effect. An effect is "a change connected with a preceding action, or an unchange [= prevention of change] connected with an accompanying action, on a thing". Nothing is here said about necessity of connexion—so a mere sequence or simultaneity in time, or mere conjunction in space, would satisfy the definition. Cause is defined as "an action (or cessation of action) connected with a sequent change or accompanying unchange of the thing acted on". The term *Connexion* is here again open to the objection hinted above. Then, how are we to distinguish between action on a thing, and the sequent change (*i.e.*, the effect) in the thing acted on? Take the action of pressing a seal on hot sealing wax. How separate between action and effect here? Cause and effect appear to be simultaneous, and the effect is due just as much to the reaction of the wax as to the pressure of the seal upon it. We are here within view of the difficulty which has led to the 'identity' theory of cause and effect. We seem not so much to have actions followed by effects (= changes in the thing acted upon) as "a peculiar conjunction of agents," S and W—from which the conse-

quence or effect (the Impression of the Seal in the Wax) results—*as soon as* we have the “peculiar conjunction of agents” S and W, we have also the effect, namely the Impression imparted by the Seal and accepted by the Wax.

Passing to Condition (chapter iii.), we are told that “a condition has never hitherto been satisfactorily distinguished from a cause. The true distinction is that a cause is an action, a condition a passive state . . . of or about the thing acted on by the cause and material to the effect” (p. 60). The difficulties recur of calling a cause simply an action (while an effect has been explained to be a change *in a thing*). “Of or about” seems not free from ambiguity, and the requirement that a condition should be a passive state, introduces the question of the relation between active and passive. What is a passive state of the thing acted upon by a cause, and reacting to it? What, again, is a passive state ‘about’ this thing? Some of the above difficulties would be escaped by accepting Mill’s not incompatible dicta (1) that the cause is the sum total of the conditions, and (2) that it is the peculiar conjunction of agents from which the consequence results. These conditions may be positive or negative and include absence as well as presence of ‘agents’. If the sum of conditions is Cause, any condition may be emphasised as pre-eminent, and for the purpose in hand be singled out as Cause (see below).

In chapter v. Dr. Mercier takes up a strongly Pragmatist attitude, and he does it very effectively—but it leads him up to, or near to, one of the theories of causation which he has repudiated in chapter i.—the view namely that before we can determine the cause of anything, we need to have a knowledge of the whole universe. He says that of all the “different series of innumerable causes both direct and indirect it is usual to select one, and to call it *the* cause. On what principle is this selection made? What, for instance, is the cause of the kettle boiling over? The action of the fire, says the master. Leaving the kettle too long on the fire, says the mistress. The neglect of the kitchen-maid, says the cook. The cook sending me upstairs, says the kitchen-maid. The cook’s forgetfulness in leaving her apron upstairs says the housekeeper. Every one of them is right. Each of these is a cause; but which is *the* cause?”—“What then should, and what does determine us in fixing upon one of the innumerable causes of an effect and calling it *the* cause? It depends entirely upon the purpose in view.” Compare Mill’s reference to the capricious manner in which we select from among the conditions that which we choose to denominate the cause.

As a result of the discussion in chapter iv. (Causation), we reach the following definition of Causation: “Causation is the necessary connexion between an action and the sequent change or accompanying unchange in the thing acted on”. (It is to be noted that the connexion between the terms of the relation is here said to be ‘necessary’.)

The objections remain to calling a cause an *action* simply, and to speaking of the cause of an unchange as contemporaneous with it, while the cause of a change is held to precede it. The time difficulty cannot be so simply disposed of.

In chapter vi. Dr. Mercier criticises Mill's Methods of Experimental [Experiential] Inquiry, and offers instead a list of twelve other Methods of Ascertaining Causation, which he says are used by scientific men in scientific matters and also by every one else in the common affairs of daily life (p. 146).

"The methods so clumsily and uncouthly described by Mill (he says) are in fact never employed; they never could be employed, for they are absurd and when applied to actual cases result in futility" (p. 103).

Mill's Methods, we may observe, are methods of proving some case (or cases) of Causation. *E.g.*, I put a lump of sugar into a cup containing Coffee and Milk, and find that Sweetness has been added to the flavour of the mixture. So by the method of Difference I reach the conclusion that *Sugar is in this case a cause of Sweetness*. This conclusion will furnish the *Minor* Premiss of an 'Inductive' Syllogism which has the Law of Causation for *Major* Premiss: thus

What is once Cause of Sweetness is always Cause of Sweetness;

Sugar is once Cause of Sweetness—

and there follows in conclusion the general statement :

∴ Sugar is always Cause of Sweetness.

But the Methods may incidentally be, and in fact often are, instruments of discovery—of ascertainment, especially the Method of Difference, and the allied Methods of Concomitant Variations and of Residues; *e.g.*, the first time I make the experiment of putting sugar into my coffee, I discover as well as prove that Sugar is a Cause of Sweetness. Again, it is by the Method of Residues (by which, Dr. Mercier says, "no cause of anything has ever yet been discovered") that the weight of a load of coal is determined—the loaded waggon is run on to the weighing machine, and the whole is found to weigh 1 ton, 10 cwt. The waggon is known beforehand to weigh 10 cwt., hence it is inferrible that the remaining weight is caused by the other factor, the coal. Thus, by the Method of Residues we both discover and prove the weight of the coal. Illustrations from everyday life might be multiplied indefinitely.

"When a china cup falls to the ground (Dr. Mercier says, p. 104) and breaks at the instant of its impact on the ground, we do not need to witness 'two or more instances in which the phenomenon occurs,' or [?and] 'two or more instances in which the phenomenon does not occur,' before we can make up our minds that the action of the impact was the cause of the breakage." Certainly not. We have in this case a typical instance of the Method of *Difference* and *not* of the Joint Method of Agreement

and Difference from the Canon of which Dr. Mercier (not quite accurately) quotes.¹

It may be admitted that Mill's Canons are clumsily and even inaccurately stated; but his own illustrations give the clue to a better statement, and for anyone who brings to their interpretation not only intelligence, but also a desire to get at the meaning, it is not difficult to arrive at their methodological value and intention.

In chapter v., under the heading 'The Uniformity of Nature,' Dr. Mercier observes (p. 101) that "The Law of the Uniformity of Nature as stated in the books is nonsense. Neither the same² cause nor the same² effect is ever repeated;" and he propounds the following Axiom of Causation: "Like actions on like things in like conditions produce like effects,"³ and adds to this the aphorism that: "The more nearly alike the actions, the things acted on, and the conditions, the more closely alike will the effects be". Briefly: "Like causes in like conditions produce like effects" (p. 99). This is "the true axiom of Causation". On it "almost all our reasonings with respect to Causation are founded" (p. 101). The statement that *Like causes produce like effects* is familiar, but limited and qualified as it is by Dr. Mercier, it presents peculiar difficulties. According to him, to say that we can have *same causes*, i.e., I suppose any two causes precisely or indistinguishably alike, is 'nonsense,' since we never have two causes the *same*. Yet "the more nearly alike the actions, the things acted on, and the conditions, the more closely alike will the effects be". What is the greatest degree of likeness (or similarity) that is yet *not* exact likeness? Are we to depend on general unanalysed likeness, or likeness point for point? And if there is any likeness whatever, must there not be some element of exact likeness? On how slight a degree of likeness between two causes may we build the expectation of corresponding likeness in their effects? What we need, says Dr. Mercier in one place (p. 112) is that the causes should be "like enough". Yes of course—but what we want to know is, what degree of likeness is 'enough'? Sometimes one has to admit that an exceedingly small difference in the cause may produce quite enormous differences in the effect. On the hundredth part of an inch to the right or the left, it may depend whether a wound is negligible or fatal—or whether it produces merely temporary mus-

¹ Dr. Mercier observes that Mill "enumerates five Methods of Experimental Inquiry, and he calls them four, and in seventy years not one of his commentators has discovered the inaccuracy". But in fact attention is drawn to the discrepancy in my *Primer of Logic*, p. 69, note.

² I presume that by *same* here, Dr. Mercier means precisely similar, *qualitatively* the same.

³ On p. 103, Dr. Mercier says that from the Axiom, "Like causes in like conditions produce like effects," we obtain "the immediate inference that: Like effects in like conditions are due to like Causes" by "a logical process that is unknown to logicians". May I point out that inferences of this kind are considered, e.g., on pp. 38-40 of my *Primer of Logic*?

cular paralysis, or permanent mental disablement. At other times one finds that causes which are extravagantly different, produce effects indistinguishably alike—as, *e.g.*, in the perfumes and crystals produced sometimes by ‘natural’ causes and sometimes by ‘synthetic chemistry’.

The twelve Methods of Ascertaining Causation which Dr. Mercier proposes to substitute for Mill’s Methods are as follows :—

- I. Instant Sequence.
- II. Subsumption under a general law.
- III. Assimilation (or Similarity, p. 108).
- IV. Association :
 - A. When sole or isolable.
 - V. B. When constant.
- VI. C. When too frequent to be casual.
- VII. D. When attended by a constant peculiarity in the effect.
- VIII. Concurrent and Proportional Variation.
- IX. Common Rarity.
- X. Corresponding Qualities.
- XI. Coincidence of Area.
- XII. Coincidence in Time.

“As all but three of these (he says) are founded on the Axiom of Causation, separate discrimination of any but these three [*viz.*, I., IV., and XII.] is to some extent artificial.”

I. In Instant Sequence, “where an action upon a thing is instantly followed by a change in that thing, we are irresistibly driven to conclude that the action is the cause of the change”. The examples of this Method given by Dr. Mercier, pp. 104, 105, are typical cases of Mill’s Method of Difference; but the inference to causation depends not on instant sequence (which is not essential to that Method), but on limitation of the circumstances introduced prior to the change in question. “Of course the method [of Instant Sequence] is not infallible,” Dr. Mercier says. Of course it is not. It is, in fact, as a *Method of mere Instant Sequence* entirely untrustworthy. In the tropics, there is ‘instant sequence’ between day and night. In a ‘near’ thunderstorm, there is ‘instant sequence’ of the thunder on the lightning, but we cannot hence conclude causal sequence in either case.

II. “The second Method of establishing a causal connexion between an action and an effect is by subsuming the instance in hand under a general law.” It would seem that if we have a general law, the causal connexion has been already established. If we know the general law that water expands when it freezes, we also know the cause of our frozen water-pipes bursting. (The agent which acts on the water is the surrounding medium, at a given temperature.) Before cases or laws can be subsumed, both the cases and laws subsumed, and the laws under which they are subsumed, must have been *ascertained*. Subsumption is reckoned by Mill, and other writers, as a mode of explanation—of linking or

systematising facts and laws already ascertained—a mode of collecting particulars under an already ascertained law, which they exemplify, not a method of ascertaining causal connexion. Every 'Inductive' Syllogism expresses such a Subsumption. But some of the cases which Dr. Mercier instances here, *e.g.*, the action of the moon upon the seas, or the reasoning of the cook who misses a jam-pot from her cupboard, seem to involve a good deal more than what is ordinarily understood as Subsumption.

III. The Method of Subsumption is said to merge into the next, *i.e.* (III.) "the Similarity of the case in hand to other cases in which the causation has been ascertained". This Method is said to be simply an application of the Axiom that Like Causes in like conditions produce like effects.

This Method of *Similarity* (*Sameness* is excluded) seems to me to be a Method of getting *suggestions* of possible connexions of cause and effect, which suggestions are afterwards tested in some other way, probably by one of Mill's Four (or Five) Methods. It is not by Similarity that the cook is convinced that her missing jam-pot was taken by the page-boy. She finds by Method of Residues that the absence of one pot is unaccounted for, and then she ascertains, perhaps by cross-questioning, that the page and no one else had access to the cupboard at the time when the jam vanished. So she plausibly assigns the residual pot to the residual agent—thus: 7 pots gone, 6 pots given out by cook—residual effect, 1 pot gone—residual cause (subsequently arrived at) page-boy at the cupboard. In the investigation referred to (pp. 110, 111) of the cause of yellow fever, disease in tomatoes, etc., *similarity* to ague and potato disease respectively may *suggest* similarity of cause and therefore Similarity of remedy in the two cases, but the suggestion has to be tested by experiment—by the Method of Difference, of Residues, or Concomitant Variations.

Method IV. Association when sole or isolable (A).

The maxim of this Method is given, p. 119 (see also p. 120), and runs as follows:—

"If in given conditions, other material things remaining the same, the addition alone of an action is attended by an effect, or the withdrawal alone of an action is attended by the disappearance of an effect, that action is the cause of that effect in those conditions". Further (p. 120) if "the action can be isolated and added or withdrawn without disturbing other material actions or conditions, then a single instance¹ is all that is necessary to establish causation, not only for that instance but generally for all cases that are similar in material respects". This is obviously the Method that is generally regarded as the Method of Difference, and the illustrations from the Torricellian barometer, the baby's crying, the wilting of a cutting in the greenhouse, are typical cases of the application of that Method.

¹It is of course not from a single instance but from the Positive and Negative instances considered together that the inference is drawn.

Method V. Association when Constant (B).

"When the Association of an action with an effect though not isolable is yet of proved constancy, causal connexion between the action and the effect may be presumed. . . . Constant association between an action and an effect may be association in presence, that is to say that if one is present the other also is present [this is Mill's Method of Agreement]; or it may be association in absence, that is to say that if one is absent the other also is absent. In practice these amount to the same thing." The second alternative is the Method of Agreement in Absence, and the two forms taken together constitute Mill's so-called Joint Method.

Methods VI. and VII. Association (C), (1), and Association (D), (2), are cases of Agreement,—(1) "in certain conditions" (p. 125), and (2) "when the effect has a certain quality" (p. 127). Many of the remarks on these special cases of Association are interesting and acute. It is a little difficult to see why Association, *i.e.*, Association of Cause and Effect, should be set out as a *separate* method of ascertainment, since there could not possibly be any case of Causation in which Cause and Effect are not associated—consider Methods I. to III. and VIII. to XII. which comprise the Methods not included under Association.

Method VIII. Concurrent and Proportional Variation.

"Causal Connexion may be established by the discovery of concurrent and proportional variation of action and effect; and is the more warrantable the closer the concurrence and the more exact the proportion." This method "replaces Mill's Method of Concomitant Variations," and Dr. Mercier's maxim of it is perhaps, in some respects, preferable to Mill's Canon, but in essentials, in intention, the Methods are the same.

Method IX. Common Rarity.

"If an unusual effect is associated with an unusual action, we are apt to assume a causal connexion between them, and the assumption has the more justification the more unusual both the action and the effect are." *E.g.*, "In sparsely populated countries the advent of a visitor is a rare occurrence. If, after such an occurrence an object is found to be missing, and this also is a rare occurrence, causal connexion between the occurrences will be presumed on the ground of their common rarity." This 'Method' seems to me to be trivial, superfluous and untrustworthy.

Method X. Corresponding Qualities.

"Any peculiar quality in an effect points to a corresponding quality in the agent that produces the effect." This 'Method' suggests considerations that may be valuable as hints, but that would mostly need to be corroborated by some more rigorous procedure. In the case of the print in the sand, recognised by Robinson Crusoe as the print of a human foot, it may be said that unless Robinson Crusoe had already known that a man's bare foot would produce such an impression, he might have been very much at a loss. The first sight of a footprint may be not at all suggestive of the cause—let alone proving it.

Method XI. Coincidence in Area.

"If an action has taken place on a certain area of a thing, and if subsequently a certain effect is found to be precisely limited to that area, then we may confidently presume that that action was the cause of that effect." The action instanced of a picture hung on a wall, and the resulting difference in colour between the bit of wall covered and the surrounding area, seems to be rather a case of 'unchange' as previously defined. Dr. Mercier appears to give up in this case (see p. 139 and compare p. 142) the distinction between conditions and cause so much insisted on previously.

In this Method it would seem that Time ought to be as much taken into account as Area. The illustrations given of physiological and bacteriological experiment are cases of the Method of Difference, and in fact on page 145 Dr. Mercier says that this Method may be called "a case in which the addition alone of an action is followed by an effect, or the withdrawal alone of an action is followed by the disappearance of an effect". (See above.)

Method XII. Coincidence in Time.

This Method it is said is "limited to the discovery of the causation of those effects that are unchanges". But surely Coincidence in Time by itself neither discovers nor proves anything at all. It is clear from Dr. Mercier's own illustrations that Coincidence in Time needs to be supplemented by Coincidence in Space, and some of those illustrations, *e.g.*, that about the noise caused by the motion of machinery, seem to be simple cases of Method of Difference—and all the examples cited seem to me to be examples of Change not of Unchange (pp. 141, 142).

Dr. Mercier's enumeration (for it is not a classification) of Methods is lengthy and awkwardly arranged (even the number is doubtful) and by his own admission is unsystematic, arbitrary and artificial. It would have been possible, he says, to diminish the number, or on the other hand to increase it (p. 146). All but three, he says—*viz.*, I. Instant Sequence, IV. (a) Association when Sole or Isolable, XII. Coincidence in Time, are founded on his Axiom of Causation, "Like causes in like conditions produce like effects". Of these three, mere Instant Sequence can be neither defined nor depended on. Coincidence in Time by itself does not discover or prove anything whatever. Sole or isolable Association, when examined, appears to have the closest possible dependence on a Law of Causation. The Methods said to be founded on Dr. Mercier's Axiom of Causation, in as far as they are so, necessarily suffer from the defects of that Axiom—besides other defects to which attention has been already drawn.

The unsympathetic violence of Dr. Mercier's attack on Mill may be to some extent condoned because of its sincerity, and there is a measure of justification for some of his criticisms. But it is impossible to accept as improvements the changes which he suggests in the definitions of Cause, Effect, Condition, Causation, etc., and in particular the list of Methods of Ascertaining Causes which he puts forward in chapter vi.

Chapter viii. on Causes of Death and Causes of Insanity is a vigorous Postscript to what precedes, and the concluding chapter—On Belief—is a sort of Appendix. Both these chapters are well worth reading. The chapter on Belief especially is, on the whole, very keen, wise and practical.

E. E. C. JONES.

A History of Mediæval Jewish Philosophy. By ISAAC HUSIK.
The Macmillan Company, 1916. Pp. i, 462.

DR. HUSIK has rendered a useful service to students of the history of philosophy by putting together this convenient and clearly written account of the Jewish thinkers of the middle ages. The course of mediæval speculation cannot be properly understood without taking into consideration the contribution of the Jews; yet by many who are interested in the thought of this period little attention is paid to it; and the present reviewer cannot pretend to more than a superficial acquaintance with one or two of the most prominent among those of whom Dr. Husik writes, so that he must in the main confine himself to calling attention to points of especial interest in the book itself.

In its earlier period the philosophical movement in mediæval Jewry dependent upon that among the neighbouring Mohammedans, especially in the rationalistic sect called the Mu'tazila or Separatists; and there seems little evidence to support the view which has been alleged that this school itself owed its origin to Jewish influences (see pp. xxv-xxvi). The tradition of the Mohammedan schools continued to be dominant in Jewish philosophical literature until, with Maimonides in the thirteenth century, it gave place to the direct influence of Aristotle. Thus it played a part in the development of Jewish thought more or less analogous to that played by the Augustinian version of Platonism in the development of Christian thought in the west during the same period.

Dr. Husik does not begin his history with the encyclopaedist Saadia, who is commonly regarded as the patriarch of Jewish philosophy, but with an elder contemporary of his, Isaac Israeli, who was translated into Latin, and in this version known to the Latin schoolmen. He is described as in his general view Neoplatonic and as in his doctrine of the soul attempting to reconcile Plato and Aristotle (Dr. Husik, by the way, in what he says here seems to overlook Aristotle's statement, *de Gen. An.* ii. 3, 736 b. 28, that the Intelligence, the highest element in the human soul, enters it *ἐκ τῆς φύσεως*, from without). Saadia (892-942) is, however, described as, after Philo, who belongs to another epoch altogether, the first important Jewish philosopher. He is also reckoned as the first Hebrew

grammarian and lexicographer. Dr. Husik seems on the whole to make out that Saadia did not know Aristotle, even in translations, at first hand; though one reason which he gives in support of this thesis would go to prove the same of Francis Bacon. Saadia's theology was determined by his polemic against the Christian doctrine of the Trinity. Life, Omnipotence, Omniscience are indeed, he holds, God's chief attributes, but, if they are to be made into 'persons' why not other attributes also? Neither these nor any other attributes of God are really distinct from one another or from the divine essence. (There is in this last statement nothing which the Christian schoolmen would have denied, but they would not have considered it inconsistent with Trinitarianism.) On another point, to which the mediaeval Jewish thinkers devoted especial attention, that of the freedom of the human will in respect of divine foreknowledge, Saadia taught that man never acted contrary to God's knowledge, not because God determines his acts, but only because God knows what will be the final outcome of man's free deliberation.

The fifth chapter introduces us to Solomon Ibn Gabirol, who lived 1021-1058, and whom Dr. Husik (forgetting Seneca) calls the first Spanish philosopher. His most famous philosophical work, the *Fons Vitæ*, was written in Arabic and translated into Latin by Gundissalinus in the middle of the twelfth century. There is no obvious trace of Judaism in this treatise, which teaches (following in the wake of a Neo-Platonic writer whose work passed under the name of Empedocles) the doctrine of a universal matter underlying all existence other than God's. This matter is itself an emanation from God and forms the basis of all subsequent emanations, celestial or intelligible as well as corporeal, though the matter in the former case is of a different nature, unaffected by quantity, magnitude, figure or colour. A mystic knowledge is attainable of this primal or universal matter, but not even ecstasy can reach to an apprehension of the divine essence—unless, indeed, an enigmatic phrase about seeing in the universal matter 'the wonder of all wonders' (*id mirabilius omni mirabili*) hints at something of the sort. A remarkable feature of Ibn Gabirol's system and one to which may have been due the neglect of the *Fons Vitæ* by his fellow Jews—it was only indeed in quite modern times that the identity of Avicenna, as the Latin schoolmen called him, with the synagogue poet Ibn Gabirol was established—is his doctrine of the Will (Wisdom or Word) of God. This is, as active, distinguished from God, and his language regarding it was sufficiently like that used by Christian theologians of the Second Person of the Trinity to mislead William of Auvergne (Bishop of Paris, 1228-1249) into supposing that the author of the *Fons Vitæ*, though bearing an Arabian name and writing in Arabic, was actually a Christian.

In chapter x. we reach Judah Halevi, also a writer of religious poetry, who was born at Toledo in the last quarter of the

eleventh century. Aristotle's doctrine of the eternity of the world, the difficulty of reconciling which with the letter of Scripture, perplexed the Jewish as it did the Christian thinkers of the middle ages, Halevi held might be admitted, if it were really established by reason, without injury to the essence of Judaism. His general attitude to such questions anticipated that of Maimonides. There was, he held, nothing in the Bible which contradicted the unequivocal conclusions of reason; but on some points reason is incompetent to inform us, and with respect to these we are left to revelation. Like several Christian writers of his period (such as Gilbert Crispin and Abelard) Judah ben Halevi composed a dialogue between representatives of philosophy and of the chief positive religions. These are described as called in to advise a king of the Chazars. The Philosopher's views are those of Avicenna. The Jew is made to assert the essential and permanent superiority of Israel to all other nations in regard to the knowledge of God. For though 'Elohim,' the ruler of the world, may be known through reason, Jahveh, the God of revelation, cannot so be known. The believer in revelation loves God and would die for him, while the philosopher only sees in him the greatest of all beings, in his worship only morality and truth, in unbelief only the fault of choosing the untrue in preference to the true. Prophets are superior to philosophers. Only Israelites can be prophets; good and wise men of other nations will have their reward, but the prophet's peculiar nearness to God is a privilege reserved for Israel, the 'heart' of humanity. In connexion with these views Avicenna's doctrines of the Active Intellect and of immortality through knowledge are subjected by Judah ben Halevi to acute criticism.

In chapter xi. we meet with Abraham ben Ezra, who followed Ibn Gabirol without naming him. The view, destructive to any faith in a particular providence, and involving a paradox to which Plato had already in the *Parmenides* called attention, that divine knowledge does not extend to transitory particular facts—a view subsequently controverted by Maimonides with arguments which were adopted from him by St. Thomas Aquinas—was held by Abraham ben Ezra, who drew from it the consequence that the creation of the world could not be due directly to God. It was rather to be ascribed to angels, who are indeed the beings primarily intended by the 'Elohim' of Scripture and in reference to whom the plural expression 'Let us make man in our image' is employed in *Genesis*. (It will be remembered that in this plural the Christians saw a reference to the distinction of Persons within the Godhead.) Ben Ezra did not, however, exclude a particular providence altogether. The good can escape the fates which the course of the stars would have ensured for them, and attract to themselves a special providence which for the majority of men does not exist. Even in the case of these favourites of heaven the natural effect of the stars' courses is produced, but the individual is withdrawn from the domain affected thereby and ultimately absorbed in the World-Soul.

The wicked, on the other hand, are left to the destiny determined for them by the stars. A considerable sphere is allowed by Ben Ezra to natural religion; the obligation of all the ten commandments, except the fourth, is evident to the natural reason; but for the simple Revelation is a necessary supplement thereto.

Abraham Ibn Daud, who is described in chapter xii. was a younger contemporary of Judah ben Halevi, born like him at Toledo, but an opponent of his views, for he believed that religion could be harmonised with philosophy. Accordingly he identifies the Holy Spirit (the inspirer of the prophets) with the Active Intellect (we are reminded of the view attributed to Adam Marsh by Roger Bacon), and recognises angels in the Aristotelian sphere-spirits. As an Aristotelian and no mystic he attacked Ibn Gabirol and anticipated in some respects the position of Maimonides. Like the latter (and like St. Thomas after him) he emphasised the proof of the existence of God from the fact of motion; but the eternity of motion he holds to be excluded by the fourth commandment, and will not even (with Maimonides) allow it to be hypothetically admissible. He expressly denies that individual souls exist before their bodies, but is silent as to their survival; which indeed is difficult to deduce from a theory of immortality based, like his, on the Aristotelian doctrine of the eternity of the *voûs*. On the question of Freedom, in Dr. Husik's opinion, 'Halevi is less consistent and more thorough; Ibn Daud is more consistent, but he fails to take account of real difficulties' (p. 231). He holds that God creates things which are *only* possible not merely in the sense that *we* do not know whether they are actually so or no, but in the sense of the objectively undetermined. The issue in such cases even God does not know; but this is not properly called ignorance on the part of God (presumably because there can be no ignorance where there can be no knowledge).

In chapter xiii. we arrive at the greatest figure in the history of Mediaeval Jewish philosophy, Moses ben Maimon or Maimonides. Dr. Husik writes that his reputation for Rabbinical learning led to his philosophy making a much greater impression on the Jewish community than that of his predecessors. It certainly did not owe its success to any undue concessions to religious sentiment. The only point in which Maimonides can be said to be in sympathy with the Neo-Platonic rather than with the Aristotelian tradition is in his use of the 'negative way' of conceiving God, and just in this point the Neo-Platonic tradition removes God from man rather than brings him near. The divine attributes Maimonides will not allow to be more than homonymous with those called by the same name in man. The command to 'love the Lord thy God' cannot be obeyed without a study of the nature of things as a whole, for only thus do we come to know that affection is a defect, to be excluded from our notion of the divine nature. He does, however (as we saw), admit a providence for individuals, though human beings are the only inhabitants of the sublunary world that enjoy its care,

and they in various degrees. He would not have allowed that 'not a sparrow falleth to the ground without your Father'. He is the enemy of all arbitrariness in religion. The laws of sacrifice are thus regarded as of merely temporary use; they were only ordained in order to wean the Hebrews who had been accustomed to offer sacrifice to the stars from that idolatrous worship (in which Abraham was supposed by Maimonides to have been bred, and the 'Sabæans' still to practise). This view of the origin of the sacrificial system of the Old Testament is found, by way, in some of the Christian fathers, *e.g.*, Jerome and Augustine.

We have already noticed the use made of Maimonides (whose *Guide of the Perplexed* was translated into Latin not long after its composition) by St. Thomas Aquinas. Dr. Husik estimates the debt of Latin scholasticism to the great Rabbi very fairly on pages 306, 307: 'There is no doubt,' as he says, 'that the method of harmonising Aristotelian doctrine with traditional teaching so far as the common elements of Judaism and Christianity were concerned was suggested to Aquinas by his Jewish predecessor.'

Down to the time of Maimonides the thinkers of mediæval Jewry with only one or two comparatively unimportant exceptions, wrote in Arabic, as did Maimonides himself, who was, as is well known, court physician to the celebrated Saladin. After him Hebrew takes its place as the language of Jewish philosophers.

The first of these after Maimonides to be described by Dr. Husik is Hillel ben Samuel (1220-1295) perhaps the first Jew to be acquainted with the Latin schoolmen. He calls Albertus Magnus and Thomas Aquinas 'sages who believe in religion'. No Jew in expounding Aristotle departed so far from the Arabian commentators as, with St. Thomas, to make the Active Intellect *aliquid animæ*, but with regard to the *Possible* Intellect Hillel took this view and regarded it as the subject of reward and punishment in a future life. It was left to another writer of the same age, Isaac Albalag, to import into the Jewish schools the questionable doctrine of 'double truth' for holding which the Parisian Averroists were condemned in 1277. A more important writer was Levi ben Gerson or Gersonides (1288-1344), a Latin translation of whose so-called super-commentaries (that is commentaries on the commentaries of Averroes) on the *Isagoge* of Porphyry and the *Categories* and *De Interpretatione* of Aristotle were incorporated in early Latin editions of Aristotle. He taught that the Possible or Material Intellect was mortal, and only the Active Intellect immortal in its own right, though the 'acquired' or 'actual' intellect of individuals, which is identical in content with the Active Intellect, attains immortality through its union with the latter. 'The more knowledge one has succeeded in obtaining during life, the more he will resemble the Active Intellect and the greater will be his happiness' after death (p. 340). The fortunes of man may be predicted so far as they are determined by the stars; but so far as they are the result of individual choice they cannot be foretold.

Events occur in inanimate nature which are unrelated to human fortunes and yet are due to chance, and these also are unpredictable. The source of prognostications, as also of miracles (the importance of which Gersonides is inclined to minimise), is not God but the Active Intellect. Gersonides, here in disagreement with Maimonides, considers the divine attributes to be more than merely homonymous with ours; on the other hand, God's knowledge of *singularia*, which Maimonides had admitted, Gersonides denies. While not asserting that God's special providence extends to species only, not to individuals (as he takes to have been the opinion of Aristotle, and also that ascribed to Job in the book which bears his name) he agrees with Maimonides and, as he thinks, with Elihu in the Book of Job that there is a special providence only for some individuals, the fates of the rest being left to be determined by the heavenly bodies. He differs from Maimonides again in not holding creation *ex nihilo*; but he does not with Averroes assert the eternity of the world. He adopts an intermediate position; God in time endowed an eternal formless matter with form; this doctrine he holds to be consistent with monotheism, since eternity is not the same as divinity.

In chapter xvi. we find a certain Aaron ben Elijah of Nicomedia (c. 1300-1369) returning from the Aristotelianism of the great thirteenth century schoolmen to the old 'Kalam' or Mahomedan philosophy of the Mu'takallamin—*loquentes (in lege Sarracenorum)* as the Latin schoolmen rendered the word—which had been originally the dominant influence in mediæval Jewish thought. He argues against the eternity of the world on grounds not only of revelation but of reason, because the sphere, being composite (of sphericity, soul, and intellect), must on the philosopher's own principles be merely a *possible* being, and so not eternal. He fears that Maimonides' attitude to the Aristotelian doctrine (which was also St. Thomas's), namely, that on grounds of reason, apart from revelation, it is tenable though not demonstrated, may lead to the assertion of it as true in the teeth of Scripture. So far from limiting God's special providence to certain select human beings, he extends it even to individual animals; and holds (against Maimonides, who on this point was a loyal Aristotelian) the lower world to have been made for the sake of mankind. He is strongly opposed to a spiritualism which does not give the bodily life its due place; and holds that even miracles cannot authenticate a religion which (like Christianity) recommends monasticism and celibacy. In chapter xvii. we find this tendency to reaction against the Aristotelianism of Maimonides and Gersonides carried further in Hasdai ben Abraham Crescas (1340-1410), whose determinism has, as Dr. Husik observes, been supposed by Joel to have exerted an influence upon Spinoza (who quotes him in one of his letters). The last philosopher here discussed is Joseph Albo (1380-1444), a disciple of Crescas, to whom chapter xviii. is devoted. He taught that Judaism could continue to exist even without the doctrine of God's

unity and even with the belief in a Mediator; its fundamental articles are three only, the Existence of God, Revelation, and Reward and Punishment. Only the first two commandments, which the people heard given by God's own voice, and which involve these three articles, are beyond the competence of any prophet to change. A prophet greater than Moses might change the rest: but it is unlikely that any such will arise.

Jewish philosophy, says Dr. Husik (echoing the concluding paragraphs of Munk's *Esquisse Historique de la Philosophie chez les Juifs*) never passed beyond the scholastic stage. 'There are Jews now and there are philosophers, but there are no Jewish philosophers and there is no Jewish philosophy' (p. 432). It is not quite clear in what sense this is meant. Was Moses Mendelssohn, for example (to whom Munk refers but whom Dr. Husik does not mention), not a Jewish philosopher? In some ways his career reminds one of that of Maimonides, though no doubt his place in the history of thought is less important. Both were in the full stream of the philosophical movement of their time and country (Aristotelianism in the one case, the Wolfian *Aufklärung* in the other); both recommended themselves to the respect of their fellow Jews, despite Jewish prejudices against an alien culture, by their Rabbinical learning. No doubt Mendelssohn did not adopt in his philosophising the mediæval attitude toward the Biblical revelation as an independent source of speculative knowledge; but if no philosophy be Jewish which does not do this, to say that 'Jewish philosophy never passed beyond the scholastic stage' is no more than a tautology: and *mutatis mutandis* the same might be said of Christian philosophy as well.

One or two inaccuracies of expression may perhaps be mentioned. 'Accident' should not be called the *genus* of the Aristotelian categories other than that of substance, as on page 9: for the categories are themselves the *summa genera* in the predicamental tree. The Platonic doctrine of Ideas should not be described (though it often is) as a 'hypostatisation of concepts' (p. 94). On page 115 a curious and un-English construction occurs twice. 'This is Platonic, not Aristotelian, who believes in the eternity of matter.' 'This is good Aristotelian doctrine, who also believes,' etc., where the antecedent to *who* is Aristotle, implied in 'Aristotelian'.

C. C. J. W.

Studies in Education. By M. W. KEATINGE, M.A., Reader in Education in the University of Oxford. London: A. & C. Black, 1916. Pp. vii, 205.

In the preface to this vigorous and able book Mr. Keatinge complains almost pathetically of the low esteem in which educational

studies are held among those who might be expected to welcome and foster them. The case is much as he describes it, and is certainly deplorable; but it is far from being inexplicable. On the whole, a nation gets the educational writers it deserves. So long as it regards its teachers almost as an alien body, in it but, *qua* teachers, hardly of it, mere purveyors of certain external goods with which it is (unfortunately) not possible altogether to dispense—so long it must expect to suffer from feeble educational literature as the natural correlative of inefficiency in its schools. From time to time a prophet may be stung to fine speech by his vision of the contrast between what is and what might be, but there can be no corpus of scientific and philosophical works comparable with those produced by other professions. In short, the teaching profession, judged from the highest standpoint, can never be of much account until it becomes a genuine organ of the nation expressing and subserving in its activities the life and growth of the soul of a people.

The best praise that can be given to Mr. Keatinge's book—and it is meant to be high praise—is that it makes for the fulfilment of the hygienic condition laid down in the preceding sentence. It should do much to give direction and content to the vague aspirations, now stirring among English teachers, towards a fuller and more fertile connexion between the work of the school and the movements of thought and life in the modern world, and it should help the instructed layman to see more clearly in what respect education is *his* business and not merely that of the craftsmen he employs to carry out the details. At the present moment the latter of these tasks is probably the more important. It is all the more fortunate, therefore, that Mr. Keatinge shows in his ideas a virility and breadth, and in his style a directness and force, which should make him welcome in circles where the schoolmaster at large is usually regarded with dislike and suspicion.

At the same time Mr. Keatinge, in his first chapter on "The Aims of Education," stands out bravely and uncompromisingly for the effective autonomy of educational science. "Few archdeacons," he remarks, "would venture to express their views about the processes by which sulphuric acid can most efficiently be produced," yet "no matter how limited a man's experience may be outside his own particular line of work, if he has achieved sufficient distinction in life, or if only he possesses a pretty literary style, he may talk and write about education *ex cathedra*, and there is every chance that both his talking and writing will be taken as seriously by other people as by himself." It would, of course, be a false move to demand the suppression of lay criticisms of schools and their methods. On the contrary, these are data to which (we venture to say on our own account) the quasi-monastic seclusion of the teacher causes him to pay far too little attention. But Mr. Keatinge is certainly right in maintaining that, however distinguished the sources from which they come, they are *only* data, and need digestion and co-ordination at the hands of the expert student of education before

they can safely be permitted to determine the form of educational practice. In other words, the ideal "educationist" will be an interpreter between the macrocosm of society and the microcosm of school, widely sensitive to the great and truly significant things in the larger life and skilled in translating them into their proper equivalents or representatives in school life and work. Speaking broadly, then, he will have to consider, in view of the present state of knowledge and of society, "what are the biological conditions of education, what demands are made by the special features of modern social life, what are the meaning and value of æsthetic for mental and moral growth, and what are the qualities which, while they may in the long run be of use to the community, should yet, apart from this, be cultivated in the individual for their own sake". To these preliminary questions the greater part of the book is devoted.

The author's discussion of the bearing of biology upon education is, perhaps, the most weighty part of his contribution, and certainly best illustrates the sanity and independence of his views. He begins with a *resumé* of the relevant results of modern inquiries into heredity, in which Galton and the biometricians are mainly followed and the history of the terrible Jukes family takes an important place. The consideration of Mendelism is excluded on the ground that "in its present condition it has little bearing on educational theory". In this connexion Mr. Keatinge might find it useful to study Prof. J. H. Fleure's recent memoir on the distribution of anthropological types in Wales—especially the suggestion that, under certain social conditions, long buried types may re-emerge and affect powerfully the general character of a local population. This view, if well founded, is undoubtedly to the point, and appears to support Mr. Keatinge's main contention—which is that education, to be really effective as a social instrument, must be administered on "aristocratic" principles. By this he means that the sound policy is to concentrate educational expenditure, financial and spiritual, upon the cultivation of special aptitudes based upon strong physical heredity rather than, under the guidance of the notion of "social heredity," to spread it uniformly and to attempt to run all our children into the same mould. He gives good reasons for the view that this policy, if boldly carried out, would do much to promote eugenic marriages, and would, above all, work effectively against the present fatal tendency of large sections of the population to become "immune" against the education given in the schools.

Mr. Keatinge treats the subject of "Education and Æsthetic" with the seriousness it deserves. He gets away from the old platitudes and well-worn *clichés*, and "documents" his chapters in a fresh and interesting way. We are entirely at one with him in his opinion that "it will be for the school of the future to lay at least as much stress on the arts of self-expression as on the acquisition of knowledge, and to ensure that æsthetic feeling shall pervade the community, quickening its interests and preserving its vitality".

Nevertheless his discussion might, we fear, be taken by one who has assimilated the teachings of Croce as an example of the way in which æsthetic questions suffer when treated from a too-exclusively psychological standpoint. In considering the pedagogy of the subject it is no doubt proper to give a larger place to the affective elements in æsthetic activity than the Italian philosopher admits in his analysis. It is, indeed, necessary to do so in view, first, of the "didactic" uses of fine literature (the legitimacy of which Croce would himself allow), and, secondly, of the deadening methods of instruction too common in our schools. But, in stressing the value of art-subjects as media for the cultivation of feeling, Mr. Keatinge comes, we think, dangerously near to the fallacy of formal training. The truth is that the importance of feeling as an element in educational activity tends to be forgotten in almost all school teaching, and, perhaps, most of all in the scientific subjects, where, apparently, even Mr. Keatinge would tolerate its absence. It would, therefore, seem more helpful to follow Croce in regarding æsthetic as a development of the "theoretical" activity of intuition, accompanied and supported, like all forms of mental activity, by feeling, but demanding cultivation in its own character as a specific type of human excellence. Lest injustice should be done to our author, it should be added that he has qualified his argument in such a way as to protect it to some extent against these criticisms; the general tendency of his doctrine appears, however, to need correction.

In the chapter on "Social Needs and the Curriculum" Mr. Keatinge devotes himself mainly to developing the position that better physical training and a better "education for leisure"—including especially a better training in the enjoyment of literature, music, and the plastic arts—are the reforms chiefly needed in our scheme of popular education. In his treatment of these questions he has anticipated in an interesting way the contentions recently set forth by a committee on behalf of the Workers' Educational Association. Mr. Keatinge's chapter and the memorandum of the committee both raise issues of extreme importance which cannot here be debated. It must suffice to indicate the most serious line of criticism by a question: Can there be a satisfactory solution of the problem of popular education if it is to be assumed as one of the permanent conditions thereof that the economic life of the bulk of the population offers an almost negligible basis for truly educational activity?

The book concludes with chapters on less closely connected topics: "Freedom in Education," "Imagination," and "Politics as a School Subject". In the first of these Mr. Keatinge disposes with much ease—dialectically—of some present-day educational prophets. Doubtless many extravagances are uttered—possibly even crimes committed—in the name of liberty in education; but it is scarcely fair to attach the responsibility for these to people who would condemn them as severely as Mr. Keatinge himself. Moreover, indulgence is due to failure in making logic-proof a doctrine

of practice based upon so elusive a notion (but so real a thing) as spontaneity. As Lord Haldane observed to the German Chancellor, it is impossible to say how many grains make a heap, but one nevertheless knows a heap when one sees it. Similarly, a visitor to a well-conducted "Montessori school" must recognise that he is in the presence of something substantially different from what is to be found elsewhere, though it may be hard to characterise the difference in general psychological terms.

For the rest, it should be said that in the chapter on politics in school Mr. Keatinge deals with a difficult and urgent question with the directness, the candour, and the suggestiveness that make his treatment of all the matters he has touched in this book so remarkably interesting and provocative of thought.

T. P. NUNN.

IX.—NEW BOOKS.

Human Ideals. By FREDERICK A. M. SPENCER, M.A. London : T. Fisher Unwin, 1917. Pp. xi, 280.

THE author of this book deals with the principles of human progress and the broad lines along which it is to be realised. He writes clearly and simply, and his outlook on the world is hopeful. He tells us his book was thought out and partly written before the War, and recent experiences might perhaps have modified his optimism. As he admits in his Preface, "Our belief in the progress of man has suffered shock from the wickedness that produced the war, and the crimes that have been committed in the course of it". Judging from his work, one would not suppose Mr. Spencer has any very wide or intimate knowledge of philosophical literature: save for a single reference to Bergson he makes no mention of philosophic thinkers, and there are hardly any references to books on social subjects. In fact Mr. Spencer pursues his argument with considerable independence of mind, and what he has to say is usually interesting and sometimes suggestive.

Although the volume is not a large one, it covers a great deal of ground, and as a consequence the reader cannot expect a very thorough discussion of many of the problems handled. These problems are ethical and religious as well as economic and social. The opening chapters deal with Morality and Religion, and these are followed by others treating of the Distribution of Wealth and Production and Consumption. Afterwards Mr. Spencer discusses such subjects as Liberty, Brotherhood, Parenthood, Education and Sex. At the close he returns to religion in a chapter on Eternal Life. What the author is chiefly concerned to do, is to point out defects in the existing structure of society and in current habits and ideas, and to indicate the general direction in which human ideals are to be realised. It will suffice to give one or two illustrations of the way in which he deals with these matters.

In a broad sense Mr. Spencer's outlook on life is religious: morality is to be based on the infinite value of souls and the hope of a transcendent society. Religion he defines—not very adequately indeed—as "the action of men whereby they seek to interact with the Supreme Intelligence". From contrition for sin man must advance to sonship with God in a Kingdom of God, or to the ideal of a universal Divine Humanity. As regards the distribution of wealth the problem, we are told, is to secure its equitable division. But besides this we require to increase the amount to be distributed, and also to ensure that the profits of industry should not be spent in luxury. The aim of life is the development of personalities, and the production of wealth ought to be made to subserve that aim. Hence the need of dealing with unhealthy trades. Most people will agree with much that Mr. Spencer says on these questions, but he is better at diagnosing the troubles in the body corporate than in showing how they are to be cured. In treating of remedies he is too vague and general, and is over hopeful about the way

in which difficulties are to be overcome. So, for instance, he says: "There are fetters of custom to be snapped, and this may demand some courage and self-sacrifice on the part of the pioneers of change. But when this is done civilisation may be expected to transform itself quite happily into something far more truly human."

Mr. Spencer has useful remarks on the existence of upper-class and lower-class occupations, and he points out there are still difficulties in the way of children of the lower ranks getting the opportunity of rising to the higher vocations, with the result that much latent ability is not utilised. When he comes to the remedy Mr. Spencer is again very general: there must be opportunity given of preparing for the higher professions irrespective of wealth, and the mass of the people must have means, leisure and education to develop their personalities. No doubt; but such generalities do not carry us very far. The chapters on Sex and on Education will repay reading. On the sex question Mr. Spencer writes with good sense. Women must have the same rights of development and citizenship as men, and the authority of the one sex over the other should only be that of moral and rational influence. Apropos of education he remarks, that hitherto it has failed to make men understand life. The reply would be, that it is hard to see how education can ensure what, in the end, must be learned by experience.

In his concluding chapter on Eternal Life the religious and mystical side of Mr. Spencer's mind is revealed. In the notion of an eternal life in God, he thinks that the mundane and supramundane aspects of the human ideal are reconciled. With progress in eternal life the temporal will be transfigured by the transcendent world; the time will come when death will be abolished and humanity itself will rise into a state of immortality. Probably most readers will find something fanciful in this idea of a glorified humanity. The scientific evidence tells against the belief that conditions favourable to life on earth will continue indefinitely. And in the doctrine of individual immortality we have the adequate assurance of the conservation of values. But if one cannot always agree with the author, he has something of his own to say on the questions he discusses, and says it in a frank and interesting way.

G. GALLOWAY.

Kant's Teleologie. Door C. PEKELHARING, Noordhoff, Groningen, 1916.
Pp. viii, 243.

This volume consists of a number of articles, published previously in theological and philosophical journals, and bearing upon the subject of Kant's teleology. In spite of the author's efforts to give consistency to the whole, a certain disproportion appears both in the space allotted to different topics and in the treatment itself. The successive chapters, after an Introduction on the notion of Final Cause, and on the value of teleological explanation,—deal with Kant's theory of knowledge; his views on the idea of Final Cause; his criticism of the argument from design; his idea of the "formal adaptation" of nature to human understanding; beauty and design; geometrical form and design; organic adaptation in nature (adaptation of part to whole in the individual); relative adaptation in nature (adaptation of species to species, of plants to animals, etc.). Some of these problems are very slightly treated, and the chapter on beauty and design is mainly a restatement of Heymans' theory. The parts giving Kant's views and their history are clear and adequate, but the critical sections are hardly satisfying.

The underlying principle of the author's judgments is given on page 13,

where *explanation* is defined, after Sir William Hamilton, as the reference of a new thing to an old or already existing thing; and on page 125, where it is said we have an innate conviction of the permanent identity of the real; all change is logical; cause and effect stand to each other simply as premise and conclusion. This also derives from Prof. Heymans, the only writer, according to Pekelharing, who has given "with perfect clearness a complete analysis of the notion of cause". The clearness may be admitted, but the completeness is another question.

From this point of view it is natural that the highest praise should be given to the Transcendental Principle which Kant introduced, his disproof of the physico-theological argument from design, and the conciliation between mechanism and teleology, which he foreshadowed (*viz.* as subordinate or preliminary principles of explanation). pp. 26, 234, etc., but that on the other hand the whole body of doctrine connected with the idea of the Reflective Judgment, such as the judgment of taste, with its subjective *a priori*, is rejected as valueless or fantastic, page 152, *et al.* The supposed *a priori* in the adaptation of organisms is also "fantastic" (p. 221), as is the idea of man as a *noumenon*, an end in himself, the ultimate, highest end in nature, etc., and as a moral will, free, above and outside of the causality of nature (pp. 238, 239). In general, it may be said that all which in Kant appeals to the moral or religious in man is rejected, and only the purely intellectual, or rather logical, approved.

J. L. McL.

Rechtskundige Significati. By JACOB ISRAËL DE HAAN. Amsterdam : W. Versluys, 1916. Pp. 273.

The full title is "Significs of Law and its application to the notions of 'accountability, responsibility, imputability'". The first chapter gives such general account as is required, in the absence of a handbook, of the new science of Significs (see *MIND*, 1899, 1900, and 1901); the second chapter explains why the particular subject of Responsibility has been chosen as an illustration of the method of Significs; while the three remaining chapters discuss the terms in question, subject them to a detailed analysis, and apply the results to particular problems.

The whole is a useful practical demonstration of the value of Significs, Semantics, or the Science of Meaning, to which Lady Welby gave the initiative in this country. The capacity of expression, it is shown, of a language is greater, the more logical the language is; a language is more logical, the more fully conscious is its use of existing and its formation of new words; Significs teaches a more conscious and logical use of words; the Significs of Law must be practised in connexion with general Significs and with the Significs of other branches of knowledge; as the power of expression of legal language increases, that of other subjects is increased, and *vice versa* (p. 88). In particular, the task of the Significs of Law is to trace the history of the meanings of all words used in the laws, pleas, judgments, etc., of a nation, to systematise them, and to suggest developments along logical lines (p. 75). De Haan shows that the so-called "laws" of language formation and development do not imply a supra-human principle, whether spiritual or material, controlling human activities, but are merely summarising and descriptive formulæ (p. 51), that the individual is not powerless or negligible as an influence making for change in the meanings of words, that such changes are conscious as well as unconscious, that a consciousness of the etymology of words is an aid rather than a hindrance (as is sometimes said) to the

force and clearness of expression; and that to put a question in pure logical words is equivalent to answering it (p. 211), in legal and moral problems at least.

The technical part seems, like so many Dutch works of science, overloaded with quotations from all sorts of authorities, great and small, of most of whom we in this country are in regrettable ignorance.

J. L. McL.

Psychologie der Frühen Kindheit. W. STERN. Leipzig, 1914.

This book includes a fairly complete account of the recent work of other writers in the psychology of childhood up to the age of six, but is based to a large extent upon the observations of the author and his wife upon their own three children. The writer's plan is to take various aspects of mental life in turn, e.g. the development of speech, memory, play and imagination, thought, suggestibility, etc., and to study the development of each from its earliest appearance in the child.

The book is perhaps the most comprehensive summary of the subject extant, though it is necessarily less complete in reference to special topics than such monographs as Miss Shinn's on Sensory Development, and the author's own thorough study of the acquisition of language. Dr. Stern marks the various stages in the development of the different mental capacities with great care, but the book is more remarkable for system than for subtlety. It should be useful for fairly advanced students of psychology, but some of it will be regarded as padding by the expert, while it is more than is required upon early child psychology by the average school teacher. It is of interest to note that this careful observer of child-life thinks very little of the methods of Freud as a means of studying the infantile mind.

C. W. V.

John of Ruysbroeck. The Adornment of the Spiritual Marriage; The Sparkling Stone; The Book of Supreme Truth. Translated from the Flemish by C. A. WYNSCHENK DOON. Edited with Introduction and Notes by EVELYN UNDERHILL. London: Dent & Sons, 1916. Pp. xxxii, 259.

It is hardly possible to do more in a review like MIND than call attention to this admirable English version of perhaps the greatest of all the mediæval mystics. Translator and editor are both to be congratulated on the way in which they have performed their work. The treatises in their English dress read like original compositions by a master in the devotional use of our language. In the introduction and the notes appended at the end of the volume, Miss Underhill supplies the English reader with adequate information about the life and connexion of Ruysbroeck, and explains with excellent lucidity the dependence of the great Christian mystics of the golden age on the philosophy of Plotinus. It might have been observed that the thoroughness of the mystics' assimilation of Plotinian metaphysics is the more remarkable that their knowledge of Plotinus, whose works were not translated into Latin until the fifteenth century, must have been wholly at second-hand through such later writers as Augustine, Boethius, Proclus, and "Dionysius". Yet almost all Ruysbroeck's most striking illustrations of the nature of the union of the soul with its Creator are to be found *verbatim* in the text of the *Enneads*, and can even usually be traced back through the *Enneads*

to their original sources in some of the more mystical utterances of Plato's Socrates. It would not be in place here to criticise as metaphysics what is meant to be a manual of practical devotion, a book of directions for the soul that is following the quest. And even if it were otherwise in place, it would be impossible to undertake an examination of the metaphysics of Plotinus in a brief notice like the present. But, since mysticisms of many kinds seem to be much in the air just now, I may just refer to one great merit of Ruysbroeck's treatises on which Miss Underhill rightly lays stress,—the very clear and plain distinction he draws between a genuinely spiritual and ethical mysticism, and its parody in doctrines of immoral and antinomian quietism. "Theosophy," "the new thought," and the rest of the quackery would have found short shrift at the hands of the earnestly *Christian* mystics of the fourteenth century.

A. E. T.

Rivista di Filosofia Neo-Scolastica. Anno ix., Fasc. 2, 3 (April, June, 1917). Milan.

The articles in these numbers are well up to the usual high standard of the review. There is a specially topical interest about Fr. Gemelli's essay in the April number on superstitions of soldiers in war time as illustrated by his own observations on the Italian front. Fr. Gemelli is an excellent psychological observer, and the volume on the psychology of the soldier, from which he tells us this paper is an extract, should be a valuable contribution to the science. Another essay of special interest at the present moment is Mr. Necchi's general review of the philosophy of Leibniz, occasioned by the bi-centenary of the philosopher's birth. The author seems to me hardly sufficiently acquainted with the important Leibniz MSS. recently published by the late M. Conturat, but his essay is of great interest as indicating the points when an able representative of Neo-Thomism feels bound to disagree with normalistic metaphysics. For my own part, I cannot help wondering whether S. Thomas himself, were he now among us, would be as Thomist as his followers. I have too much reverence for that great intellect to be very ready to believe that it would be imposed on by the trivial considerations urged by Mr. Necchi against the "actual infinite," and I should have thought it hardly correct to say of Leibniz's schemes for the reunion of the Churches that they had the fault of requiring the Roman Church to make all the concessions. Unless, indeed, what is meant is that Romanism has *since* Leibniz's time become so ultra montane that to concede anything at all is to concede its first principles. In a third essay in the April issue on the "Philosophy of Contingency," and one in the June number on Boutroux, L. Borriello makes an interesting study of the spiritualist reaction against Positivism in France. Of the other articles in the June issue, one by L. Botti is a thoughtful discussion of the attitude of philosophy to war, the other, by F. Olgiati, discusses the philosophical worth of Royce's idealism from the Thomist standpoint. With most of the writer's criticisms on the lack of the needful realistic basis in Royce's scheme of things, I find myself much in accord. I should add that the criticism is conjoined with eloquent appreciation of Royce's aims and achievements. There is an interesting "note" by B. Rutkieriez on the philosophical significance of "vitalism," and I am glad that the *Rivista*, which cannot be suspected of Kantian leanings, has uttered a dignified protest against the attempt to make the events of the present war a ground for personally scurrilous attacks on the character of Kant.

A. E. T.

Received also :—

- Sri Ananda Acharya, *Brahmadarasanam, or Intuition of the Absolute*, London, Macmillan & Co., 1917, pp. xii, 210.
- De Witt H. Parker, *The Self and Nature*, Cambridge, Harvard University Press, 1917, pp. ix, 316.
- James Drever, *Instinct in Man*, Cambridge University Press, 1917, pp. x, 281.
- Antonio Aliotta, *La Guerra Eterna, e il Dramma dell' Esistenza*, Napoli, Francesco Perrella, pp. 221.
- Giuseppe Saitta, *Il Pensiero de Vincenzo Gioberti*, Messina, Giuseppe Principato, 1917, pp. 452.
- Benedetto Croce, *Logic as the Science of the Pure Concept*, translated by Douglas Ainslie, London, Macmillan & Co., 1917, pp. xxx, 606.
- John Laird, *Problems of the Self*, London, Macmillan & Co., 1917, pp. vii, 375.
- Giovanni Gentile, *Le Origini Della Filosofia Contemporanea in Italia*, vol. Primo Il Platonici, Messina, Giuseppe Principato, 1917, pp. ix, 410.
- James Gibson, *Locke's Theory of Knowledge and its Historical Relations*, Cambridge University Press, 1917, pp. xiv, 338.
- J. G. Vance, *Reality and Truth*, London, Longmans, Green & Co., 1917, pp. xii, 344.
- William M. Salter, *Nietzsche the Thinker, A Study*, New York, Henry Holt & Co., 1917, pp. x, 539.
- Fr. Agostino Gemelli, O.F.M., *Il Nostro Soldato*, Milano, Vita E. Pensiero, 1917, pp. xii, 339.

X.—PHILOSOPHICAL PERIODICALS.

PHILOSOPHICAL REVIEW. Vol. xxvi., No. 4. **B. W. Van Riper.** 'On Cosmic Reversibility.' [The notion of reversibility, whether it be the orderly undoing of its work by a machine, or a concept applicable to the ultimate hypothetical world of abstract physics, or an objective analogue of the backward reading of a mathematical equation, or a reversal of the time-stream itself, dissolves away into pseudo-mathematical dreaming.] **H. Haldar.** 'Leibniz and German Idealism.' [Leibniz' conception of ultimate reality as a system of minds in which an all-inclusive spiritual principle is realised is essentially that of Kant, Hegel, and Lotze: witness the final development of the thing-in-itself, Hegel's Absolute as impersonal unity of finite but perfect selves, and Lotze's relations as modes of the one all-embracing mind.] **H. E. Bliss.** 'The Subject-Object Relation.' [Objects exist external to and independent of subjects. Object implies not merely existence in relations but the special relation of appearance to a subject, or subjects, so qualified and so related as to apprehend such object. Subject is that to which objects appear, have appeared, or may appear.] Discussion. **C. Rinaker.** 'The Dualism of Mr. P. E. More.' [More's system is not dualistic; in its practical working it is partly pragmatic, and in the last analysis it is essentially idealistic.] Reviews of Books. Notices of New Books. Summaries of Articles. Notes. **R. M. Yerkes.** 'Hugo Münsterberg.'—Vol. xxvi., No. 5. **A. Lalande.** 'Philosophy in France, 1916.' [Discusses the influence of the war on morality, by way both of present unification (Barrès, Petit) and of future problems (Belot, Maxwell); analyses Le Dantec's *Le problème de la mort et la conscience universelle*; pays a tribute to Delbos and Ribot.] **R. B. Perry.** 'Purpose as Tendency and Adaptation.' [Neither temporal direction nor tendency nor the relation of an external agency to a tendency signifies purpose. The term might be predicated of adaptation or complementary adjustment (compensatory, progressive, preparatory); but we are here still in the realm of the automatic; and purpose is therefore best reserved for plastic or modifiable adjustment.] **J. Laird.** 'Introspection and Intuition.' [Critique of Bergson. Introspection, regarded as an act of direct acquaintance with the mind, is a feasible operation; and psychology therefore does not require a theory of knowledge peculiar to itself, or a special faculty of intuition.] **J. E. Creighton.** 'Two Types of Idealism.' [Mentalism or existential idealism asserts that everything is mental in character, and by thus transforming experience into an order of existences takes on the problem and mode of thought of realism. Historical speculative idealism sees that the reality known in experience, as existing concretely, forms part of a permanent system of relations and values; it thus holds fast to the unity of existence and significance. "Experience is at once an explication or revelation of reality, a comprehension of the mind of one's fellows, and a coming to consciousness on the part of the mind of the nature of its own intelligence."'] Discussion. **A. O. Lovejoy.** 'Progress in Philosophical Inquiry.' [Reply to critics of the proposed *Summa Metaphysica*.] **J. Lindsay.** 'The Knowledge of Other Minds.' [Reality is the support

of value, and selves may be known as well as their purposes and intentions.] Reviews of Books. Notices of New Books. Summaries of Articles. Notes. **J. Loewenberg.** 'A Bibliography of the Unpublished Writings of Josiah Royce.' **W. M. Urban.** 'A Correction.'—Vol. xxvi., No. 6. **A. K. Rogers.** 'The Nature of Certainty.' [Certainty attaches to intuitions not because they are necessary but because they are self-evident. There is no ultimate necessary truth except the formal truth that reality cannot combine strictly contradictory predicates. Self-evidence applies solely to judgments about the content of present (or just past) experience, to the effect that this content exists and that such-and-such is an accurate description of it.] **H. C. Warren.** 'The Mechanics of Intelligence.' [Every factor concerned in the manifestation of intelligence (selection of movement, learning, satisfaction) may be adequately explained in neural (physicochemical) terms without the hypothesis of a guiding influence of consciousness. The value of consciousness is the subjective life which it furnishes to the individual.] **G. A. de Laguna.** 'Phenomena and Their Determination.' [We must distinguish real from pseudo-phenomena, which are indeterminate; and analysis of a phenomenon into elements from its reduction to a collection of items occupying the same *locus*. Philosophical atomism assumes wrongly that, because any *locus* may be described in a certain way, any phenomenon may be so described.] **A. R. Chandler.** 'Professor Husserl's Programme of Philosophic Reform.' [Neither the reduction to pure consciousness nor the reduction to eidetic analysis affords to phenomenology any novel content outside the scope of an exhaustive psychology. The gain by concentration of attention is more than offset by the loss of a consistent method and of guiding ideas derived from other sciences.] Reviews of Books. Notices of New Books. Summaries of Articles. Notes.

BRITISH JOURNAL OF PSYCHOLOGY. Vol. viii., Part 2. **Henry J. Watt.** 'Stereoscopy as a Purely Visual, Bisystemic, Integrative Process.' [Maintains that the integration of stereoscopy cannot include any quality other than visual; that stereoscopy cannot be founded on any single attribute except "systematic order," and not directly even upon that, and that it rests proximately upon bisystemic differences of distances and forms. A full discussion of the author's theory follows.] **N. Carey.** 'Factors in the Mental Processes of School-Children. III. Factors concerned in School Subjects.' [An examination of correlations obtained between various school subjects. Children who do particularly well in work involving especially motor co-ordinations are often lacking in general ability. Results indicate the existence of (a) a general factor, (b) one large additional complication, the motor factor, (c) one small additional complication, the association between written words and their meanings.] **A. W. Walter.** 'The Process of Negation.' [An experimental study which revealed two psychologically distinct forms of negation—(1) Negatives of construction, which are psychologically similar to affirmatives, so that *S is not P* is better represented by *S is non-P*; and (2) Negatives of denial, which involve a more or less emotional attitude of hostility or distrust.] **James Ward.** 'A Further Note on the Sensory Character of Black.' [Replies to Titchener's criticisms of the author's contention that black is not a sensation.] **F. C. Bartlett.** 'An Experimental Study of some Problems of Perceiving and Imagining.' [Discusses, among other points, the parts played by feeling and by imagining in the process of perception.]—Vol. viii., Part 3. **Godfrey H. Thomson.** 'A Hierarchy Without a General Factor.' [Shows a hierarchy of correlation

coefficients obtained in dice-throwing experiments.] **C. Spearman.** 'Some Comments on Mr. Thomson's Paper.' **Carveth Read.** 'The Relations Between Magic and Animism.' [After dealing with the theories of Wundt and Frazer, discusses the ideas and practices of magic adopted by Animism and the knowledge of spirits about magic, their mode of operation through magic, and their control by magic.] **W. G. Smith.** 'The Prevalence of Spatial Contrast in Visual Perception.' [Experiments revealed that contrast-effects are dominant in the case of men, confluence-effects in the case of women.] **May Smith.** 'A Contribution to the Study of Fatigue.' [Experiments, extending over three years, in fatigue produced by loss of sleep. In the first phase fatigue acts as a stimulant; later, there is a loss of accuracy and of concentration. Subjective feelings are quite unreliable as a clue to the extent of fatigue. It seems possible to become partially immune to a particular form of fatigue. The time taken to return to a normal condition after the loss of a few hours' sleep is disproportionately great.] **Bernard Muscio.** 'The Influence of the Form of a Question.' [Experiments on fifty-six persons: questions asked about moving pictures. Suggestiveness decreased by use of the definite article instead of indefinite; increased by introducing a negative into the question. Use of objective form of question (Was there a dog?) instead of subjective form (Did you see a dog?) decreases suggestiveness and decreases caution. The practical value of the conclusions in cross-examining are discussed.]—Vol. viii., Part 4. **Carveth Read.** 'On the Differentiation of the Human from the Anthropoid Mind.' [Attributes the evolution of man from anthropoids to the adoption of a life of hunting for animal food and as a consequence the development of "pack" life: hence it is that man resembles the dog more than the ape. The development of various psychological characteristics of man is traced to the necessities consequent upon hunting in packs.] **A. Wohlgenuth.** 'On Feelings and their Neural Correlate with an Examination of the Nature of Pain.' [If, as usual, it is granted that every elementary state of consciousness corresponds to a definite nervous process then the feelings have their neural correlate in the excitation of specialised neurones. An experimental investigation showed that pain was not a feeling-tone or the acme of unpleasantness, but a sensation of definite modality which is not always unpleasant and which may be pleasant. The writer discusses the evidence of Head and Holmes, which suggests that the centre for feeling probably has its seat in the lateral zone of the optic thalamus.] **J. C. Flügel.** 'Freudian Mechanisms as Factors in Moral Development.' [Discusses the three ways of solving mental conflicts, *viz.*, repression, displacement (including sublimation), and deliberate choice. The possible bad consequences of repression are considered, and the relative superiority of sublimation shown, though of the mode of sublimation little is known, and probably, as a rule, it is unconscious. From the point of view both of morality and mental health, conflicts are best settled by "deliberate choice," which, as contrasted with repression, is characteristic of a relatively advanced stage of evolution and of democratic rather than autocratic forms of government. Socrates' doctrine of the relation between virtue and knowledge is also discussed in the light of Freudian psychology.] **Shepherd Dawson.** 'The Experimental Study of Binocular Colour Mixture.' [A brief historical survey followed by an elaborate experimental investigation dealing with binocular combination of complementary colours, of non-complementary colours, colours of the same tone and brightness but of different saturation, the effect of background, and of contour and size of coloured surfaces. A full bibliography is appended.]

"SCIENTIA" (RIVISTA DI SCIENZA). Series ii. Vol. xx. Part 2. August, 1916. **J. L. Heiberg.** 'Le rôle d'Archimède dans le développement des sciences exactes.' [Short and excellent sketch of the position of the work of Archimedes in the history of Greek science, its influence on his contemporaries and succeeding generations, and the fate of his various manuscripts.] **L. De Marchi.** 'Le acque del Carso.' [On the burning question of the subterranean circulation of water in the fissures of the calcareous rocks in the Carso.] **L. Vialleton.** 'A propos de la loi biogénétique: Les ébauches embryonnaires et la précocité de la forme spécifique.' ['This is not a discussion of the biogenetic law. Such a subject would demand much more than an article. I wish simply to recall some facts borrowed from the development of vertebrates, which, in spite of their importance for the discussion of this law, have not had, it seems to me, enough attention paid to them.'] **J. B. Clark.** 'The Economic Dynamics of War.' ['What we chiefly need to know is in what condition nations will find themselves when they have added, let us say, fifty billions of dollars to their previous debts, and have, at the same time, greatly reduced their power to pay debts. Only the purely economic effects lend themselves to measurement, and a few principles applying to these are what this paper will attempt to state.'] **E. Catellani.** 'Condizioni e presidi di pace.' [To answer the questions as to how we can shorten the war and preserve the future peace, the author quite understandably finds it necessary to compare the present situation with that of the greatest wars of the past, and then considers in the light of the results of historical experience, the means proposed or tried up to the present time to preserve relations between states from armed conflicts.] Book Reviews. [We may notice a review of three books on heredity and memory by E. Hering, V. Haecker, and J. Ward.] Review of Reviews. French translations of Italian and English articles.—Series ii. Vol. xx. Part 3. September, 1916. **E. E. Fournier d'Albe.** 'The Future of Selenium.' [In 1873 it was found that the resistance of selenium falls on exposure to light. A phenomenon quite distinct from this was discovered in 1878: it is the generation of an electromotive force in a voltaic cell in which selenium is an electrode, as soon as light falls upon the selenium and during the whole time of illumination. After indicating the reasons for the failure of many devices involving the action of light on selenium, and giving a list of six suggestions for and partial or complete solutions of such devices, the author indicates the main lines of probable development, and gives some numerical data on which prognostications may be based. Selenium 'enables us to translate light into any other form of energy, to make a star ring a bell or record its passage on a chronograph, to make a beam of light convey an audible message or explode a mine. It gives to light a new importance, a new function, a new interpretation. Wherever a beam of light can penetrate, there it can be the bearer of human intelligence and human will. And every beam of light bears within itself untold secrets which only selenium can reveal. Its future is likely to be as important as photography has been in the past. It is in its infancy. No longer need we look for the future developments of physical science "in the third decimal place" only. For here is a world unexplored just laid open to us, and plenty of discoveries to be made by every earnest seeker after truth.'] **H. de Vries.** 'Croisements et mutations.' [Up to the present time only one group of organisms has been discovered which reveal in their full richness the phenomena of heredity and hybridation. Almost all the other groups are constant and uniform as regards heredity, and follow Mendel's law in their crossings. The evening primrose alone behaves differently in

different cases. . . . The study of the origin of the mutations of the *Oenothera* has given us a rapidly increasing collection of facts which may serve for the discussion of the origin of species in general (cf. the author's article in *Scientia* for January, 1916). It has, besides, awakened a lively interest for the experimental treatment of this very important question.]

E. Rignano. 'Il ragionamento "intenzionale". Parte I^a: Il ragionamento dialettico.' [In the author's previous researches (*Scientia*, 1915) on reasoning, the reasoner was not supposed, at the beginning of his reasoning, to have any wish to sustain certain theses to the detriment of certain others, but simply the wish to discover the *truth*, whatever it may be. The 'intentional' reasoner, on the other hand, reasons to justify certain well-defined affirmations. He knows the aim and end of his reasoning because *he wishes it*. In this article a psychological analysis of dialectical reasoning is given: a second part will deal with the other principal variety of intentional reasoning—metaphysical reasoning.]

G. Alexinsky. 'Les éléments européens dans l'économie nationale russe.' [A mass of interesting details showing that 'it is no exaggeration to say that, though, as to political forms, Russia is as yet far from being truly Europeanised, its economic bonds and aspirations are far more European than Asiatic.' The place of England in the Russian market is lower than that of Germany, but much higher than that of the other European countries. Causes of the commercial supremacy of Germany in Russia. 'The Germans, far from being prevented by England from making huge conquests in Russian trade, actually try gradually to monopolise the trade.']

G. Diena. 'Per l'adozione di un diritto internazionale convenzionale fra gli Stati dell'Intesa.' [The author thinks that the results of the recent Paris conferences between the Powers of the Entente are not enough: it would be eminently useful that these Powers could come to an agreement on a precise code of international law between themselves. For a durable progress of international law we must at present try, not so much to extend the adoption of those rules which would entail too great sacrifices for those States which adopt them, but rather to intensify the progress of certain positive rules among a small number of States which are ripe for submission to them. Respect for treaties is fundamental. The author would like a sub-Committee of Entente members of the Institute of International Law to assist the ripening process referred to.]

Book Reviews.—Series ii., Vol. xxi., February, 1917. **G. Loria.** 'L'enigma dei numeri immaginari attraverso i secoli.' [At first, of course, 'imaginary' numbers were ignored and then banished; then (sixteenth century and later) they were tolerated. An excellent and interesting article, in which the services of British mathematicians of the early part of the nineteenth century are (as is to be welcomed) described rather more fully than has usually been the case with historians of mathematics.]

P. Zeeman. 'L'hypothèse de l'éther immobile.' [The fundamental (Fresnel's) hypothesis of the immobility of the ether is: The ether passes freely through the earth, and the velocity communicated to it (because it is partially dragged along by refracting bodies) is only a small part of that of the earth. There are three phenomena which are in favour of the hypothesis of the immobility of the ether: the aberration of stars observed by Bradley; the experiment of Fizeau, which has lately (1916) been repeated under more exact conditions by the author; and an experiment (1903) of the Russian physicist Eichenwald.]

J. R. Carracido. 'Les fondements de la biochimie.' [The only positive foundations of biology are those of biochemistry.] **T. N. Carver.** 'The Probable Effect of the European War upon the Redistribution of Population.' [After detailing some general principles of

migration, the author remarks that, in the present application of these principles, much depends upon the outcome of the war, and that probably the largest factor in the whole problem is the Turk, whose rule is quite extraordinarily bad. 'The quality of the immigration to the United States is likely to fall rather than to rise after the war. In the first place, we shall doubtless get considerable numbers of those whose chief desire is to avoid military duty. . . . In the second place, the contraction of the markets of the nations that are beaten will force a redistribution of the congested urban population. . . . A few high-spirited people may come to us to avoid the shame of living under an odious conqueror; but that depends upon the outcome of the war.] **J. B. Napier.** 'The Probable Future of Britain as a Military Power.' ['If Germany is well beaten Britain will not seek to increase her European interests and influence, except so far as the definitive treaties entered into by her, at the close of the War, necessarily involve such an increase. She will, I think, however, greatly strengthen her military organisation, rather with the view of enabling herself to fulfil her obligations to her Allies . . . than because she is distrustful of her pre-war defensive organisation. . . . She will not seek to become a military Power in the Continental sense. . . . England aims, not at supremacy, but at being an equal member of a European confederacy. . . . If the war should end without a decisive victory for the Entente Powers; if Germany should not be so beaten that she sets about to change her evil heart . . . , then very different considerations will determine British Policy.' Then the author becomes rather vague and very eloquent.] Book Reviews. [The books on economics that are dealt with are A. C. Pigou's *Wealth and Welfare* (London, 1912) and *Unemployment* (London, 1915), W. C. Mitchell's *Business Cycles* (Berkeley, Cal., 1913), and A. Loria's *Les bases économiques de la justice internationale* (Kristiania, 1912).] Review of Reviews. Chronicle. [A new journal, the *Nuova Rivista Storica*, has appeared at Rome: it is a welcome sign of the renaissance of historical studies in Italy, and a protest against certain errors in German historiography.] French translations of articles in Italian and English.

XI.—NOTES.

THE DREAM OF "FRUSTRATED EFFORT":

A SUGGESTED EXPLANATION.

THE suggestion proffered in this article implies at least three things. Firstly, the occurrence of a specific type of dream that can be labelled "frustrated effort"; secondly, a corresponding tendency in the dreaming mind to dream in this particular way; thirdly, a cause behind this tendency that can be isolated and distinguished. The two ends of this series contain the debateable points. If there be a specific type of dream in which we try to do things and fail, it must result from a tendency to dream in this way. The main difficulty resides in the third term. If the tendency exist it must repose upon cause; but it is much easier to perceive that a cause is there than to deduce its nature. It is comparatively easy to demonstrate the existence of the first term—the existence, that is, of a definite class of dream in which we experience "frustrated effort".

It is difficult to resolve the chaos of the dream-world with any completeness; but it is possible to perceive that the dreaming consciousness has certain habits—it distinctly tends to dream along certain lines. In his Essay on "The Sublime and Beautiful" Burke refers to a dream of falling, and his reference indicates that he regarded it, both for himself and for others, as a very common experience. The belief that a sleeper who touches bottom in a falling dream never wakes again intimates a recognition by the popular mind of this particular type of dream. Hutchinson, from replies to a questionnaire, found that the dream of falling was both widely distributed among dreamers and of frequent occurrence in the dreams of certain individuals. On arranging the dreams in classes and placing them in order of frequency this dream came second on the list. It was only exceeded in popularity by the dream of flying. Statistical inquiry is hardly necessary to establish these two particular habits of the dreaming mind. Many, perhaps most, people confess to either or both of these types; and the flying and falling dreams are important because they indicate very clearly that in dreaming there are at any rate some distinctly marked lines of tendency.

Hutchinson classed a number of other dreams under the heading "Trivial Inconvenience". A traveller is packing for his journey. The portmanteau will not shut; garments persist in strewing the floor. The clergyman in his pulpit cannot find his manuscript. The nightfarer's latchkey will not turn in the lock. Now these are dreams of "frustrated effort". People are trying to do things and failing. Without making a Procrustes' bed of this particular class, into which dreams are fitted by lopping or stretching or judicious squeezing, it seems reasonable to refer in this connexion to another of Hutchinson's classes—the Bogey Dream. It has been remarked that Christian's floundering in the Slough of Despond is a typical dream situation. Inability to move is a familiar

feature of nightmare. The feet may be mired in mud or clay, or stuck in pitch or treacle; the victim may be glued to the spot by fear or bound to a stake or pinned like a cockchafer or fastened by any other device in nature's repertoire. In all cases there is the same horrible powerlessness. In the genuine Bogey Dream we are not only unable to move but pursued by some dread monster. Sometimes the situation is reversed into an irresistible drawing towards some dreaded person or object. This constitutes another class of dream. It is thus possible to cross-classify through three of Hutchinson's classes in terms of the element of "frustrated effort".

General inquiry confirms these statistics. Many people confess to the dream of "frustrated effort," and, very significantly, frequently confess to its trivial forms. The failure is often in matters that are normally easy of performance. A common incident of daily life is reproduced in the dream with an unsuccessful attempt apparently deliberately introduced into it. It seems possible, indeed, to recognise a subspecies of Professional Nightmare in which the victim attempts some part of his daily routine and fails hopelessly. The professor cannot find his laboratory; the analyst cannot perform his test; the clergyman cannot find his place. Here the dreamer fails just where, in real life, he is most competent.

Investigation, then, seems to give reasonable assurance that there is a definite, specific type of dream in which the dreaming consciousness displays a marked tendency to introduce the element of failure. This tendency is still more clearly marked by the apparently anomalous character of the "frustrated effort". The mastery of the real situation contrasts sharply in so many cases with incompetency in the dream that the dreaming consciousness must contain some definite tendency to insert the element of frustration. This tendency must repose upon some cause—upon some characteristic of the dream state. What is this cause? The following suggestion endeavours to answer this question.

Dreams are largely composed of memories, but these memories are employed in different ways. Sometimes they provide the raw material for an entirely new situation. Readers of Wilkie Collins' *Armada* will remember a skilful analysis of a dream into components derived from incidents in the life of the dreamer. Sometimes a block of memory, an incident or situation, is practically reproduced as such in the dream. The typical dream of "frustrated effort" is such an en bloc reproduction of a familiar situation, into which the element of failure is inserted. In a cricketing dream of this type the batsman dreams that he is bowled. He stands near the wickets in the open space of the cricket field; he is aware of the fieldsmen around; he takes his stance; he sees the bowler run towards him and deliver the ball. Now the visual representation is rarely very complete. It is usually vague and shadowy compared with the actual impressions received through waking sense. But, though it is a sketch of or excerpt from reality rather than a complete picture of it, it is usually adequate. The batsman's dream-picture is sufficient to convince him that he is where the dream says he is and doing what the dream says he is doing. The visual representation is adequate—it renders the situation imperfectly, but it suffices to make it appear real.

The critical instant is the moment of approach between bat and ball. Both in real life and in the dream there are two alternatives—disregarding subsidiaries like tips and snicks. Either bat meets ball fair and square or—it does not. In this particular instance a characteristic sensation announces success, while its absence intimates failure. Avoiding psychological niceties, this sensation can be described as "arm-shock".

The batsman feels he has hit or knows he has missed. If the dreaming consciousness have difficulty in reproducing this particular sensation the dream will naturally arrange itself into a failure to hit—conforming, as far as possible, to the data at disposal. Its absence in real life informs the batsman he has missed—he draws precisely the same conclusion in the dream. The visual representation naturally follows the cue of the absent sensation and the batsman sees, or may see, the actual flying of his stumps.

The nature of the proffered suggestion is now coming into view. The indicated explanation of the cricketer's nightmare is connected with a particularly emphatic example of a set of sensations that, it is suggested, play an important part in the dream of "frustrated effort". In comparing the dream with reality we must consider the total psychical situation. There is no need, in the present instance, to use terms such as "subconscious" or to be meticulous in psychological classification of sensations. It is enough to remember that in our conscious field, at any moment, there is a background and a foreground. Certain elements, ideas or sensations, or whatever they may be, are more prominent—more, as it were, in the direct line of sight. Others are more in the shade—more removed from attentive regard. When we move or act there are in the mental background certain more or less dimly perceived sensations derived from our moving parts. The professor dreams that he wanders through the university passages, unable to find his laboratory. The visual representation of the scene is probably vague and usually rather kaleidoscopic, but it is, as in the cricket dream, sufficient to convince the savant that he is in his familiar haunts. It is possible that the somewhat ragged, shifting visual imagery may, in some dreams, assist in inducing perplexity and thus support the tendency to dream of failure. But the visual imagery is not the complete psychical situation of waking life. There are "background" sensations received from the moving limbs, from contacts between foot and ground and the like. The psychical situation is only complete when these are present. Since the professor is not actually walking in the dream these "background" sensations can only be present if the dreaming mind is able to reproduce them from memory. If they cannot be reproduced then the dream situation is incomplete. The foreground of consciousness is adequately rendered by the visual representations, but the background is missing or inadequate. The situation will *SEEM* right to the dreamer but it will *FEEL* wrong. The feeling of wrongness naturally connects with the end of the professor's endeavours, for the mind's attitude is essentially anticipatory, and the dreamer falls inevitably into a "frustrated effort". It is suggested that the dreaming mind is unable, or often unable, to supply the "background" assemblage of sensations derived from touches and limb movements, and that this inability is the main source of the tendency, often realised, to dream of failure in attempt. It may be noted that the "background" sensations might be expected to drop out most completely in the dreaming mind's imperfect reproductive effort.

An analyst dreams he cannot perform his tests. By a convenient synecdoche the raising of the reagent bottle to the testing tube may be taken, as one part of the procedure, to represent the whole. In real life the attention is focussed for the most part on visual elements, on the expected appearance, for example, of a precipitate. But an essential part of the psychical situation is composed of sensations derived from movements of the arm. Probably the touch of the reagent bottle on the fingers is also a significant item. If the operator be supposed to be suddenly deprived of these sensations, recessive in the background of his

consciousness, it is easy to understand that a feeling of bewilderment and failure might arise. There would be conflict between what is seen, bottle, tube and dimly perceived surroundings, and what is not felt—if it be not too Irish to speak of a conflict with an absence. There would be confusion and a sense of wrongness and failure. Again it is suggested that the dream performs for us just this psychological experiment. The reproductive powers of the dreaming mind fail just where it is reasonable to suppose they would be least—they drop the conscious background appropriate to the situation and the dream resolves into a "frustrated effort".

Prof. Mourley Vold of Christiana has made some interesting observations on the relations between dreaming and the positions of the limbs. For instance, a curved foot during sleep may produce a dream of pirouetting on the toe—roughly corresponding to the sensations received from the curved foot. We may note in this connexion that in the dream of flying the subject often floats in a prone position. This corresponds to the actual sleeping posture. If we accept Vold's suggestions we conclude that if the general arrangement of the body during sleep is such that the dreaming mind can adopt an adequate supply of appropriate "background" sensations the dream will probably not involve any element of frustration. For instance, if the sleeping analyst have his finger-points closed on his palm the dreaming consciousness might be able to supply the necessary "touch" of the bottle and avoid the sense of failure. The suggestion here offered applies more particularly to those cases where the general bodily conditions do not form an appropriate context for the dream. If the body remain still and prone during a dream involving walking or turning a key or lifting a bottle, or packing a portmanteau or wielding a cricket bat, the dreaming mind has to depend on reproductive memory for an appropriate supply of "background" sensations of movement or touch, and the suggestion is that the element of "frustration" often appears because the dreaming consciousness is unable to reproduce this supply in an adequate manner.

The tendency of the dreaming mind is thus, according to the present suggestion, often towards "frustrated effort" because of its frequent inability to reproduce with completeness the psychical situation corresponding to the real event. It finds most difficulty in an adequate rendering of the sensations normally in the background of consciousness—sensations derived from our movements, various feelings of touch and the like. This imperfect reproduction leads to a feeling of confusion or wrongness that finds expression in the failure of our attempts. It is probable that this tendency is always more or less present, but it may be suppressed or overruled in various ways. Sometimes the dream so suits the bodily posture or is so adapted to such sensations as it can receive, that the tendency hardly exists at all. It may be so over-riden by the insistence of the other elements of the dream that we are compelled to accept the situation in spite of its imperfect rendering. But from time to time the dream situation is so out of harmony with our bodily posture and general sensational condition, and the mind is so unable to fit the background of consciousness with appropriate elements, or even to supply a more prominent sensation like the "arm-shock" of the batsman, that we are thrown into a mental confusion and dream of "frustrated effort".

JOSHUA C. GREGORY.

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 HARDIE (R. P.), 13 Palmerston Road, Edinburgh.
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McINTYRE (Dr. J. L.), Abbotsville, Cults, Aberdeenshire.
McIVER (Prof. R. M.), The University, Toronto, Canada.
MACKENZIE (Prof. J. S.), 56 Bassett Road, North Kensington, W.
MACKENZIE (Dr. W. L.), 4 Clarendon Crescent, Edinburgh.
MACKINTOSH (Prof. H. R.), 81 Colinton Road, Edinburgh.
McTAGGART (Dr. J. M. E.), Trinity College, Cambridge.
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SHAND (A. F.), 1 Edwardes Place, London, W.
SHARPE (J. W.), Woodroffe, Portarlinton Road, Bournemouth.

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 WILSON (S. F.), 2 Sherwood Street, Warsop, Mansfield, Notts.
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